SANTA CLARA VALLEY WATER DISTRICT

UVAS CREEK HYDROLOGY STUDY

DRAFT

S-9

Study by

Abdallah (Al) D. Saah P.E., P.H.
Consulting Civil Engineer, Hydrologist
& Water Resources Specialist

And
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Engineering Unit Supervisor

Wendy Chang PE
Associate Civil Engineer

Nahm Lee
Assistant II Engineer

Under the Direction of
Nai Hsueh
Deputy Operating Officer
Santa Clara Valley Water District

June 1, 2003

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June 1, 2003

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1 SUMMARY OF FINDINGS

The following two tables contain summaries of the findings of this study. Table 1 shows the 1% and 10% design flood peaks and 24-hour volumes with projected urban growth condition through 2050 and 15% ratio of imperviousness. Table 1, also show the previous design flows that were developed in 1978 as well as flows from recorded data. Table 2, on the other hand, shows the 0.5% and 50% flood flows. These values were calculated from the 1% and 10% flows by using the general statistical formula and Log Pearson Type III distribution with skew factors equal to -0.6 for the peaks and -0.64 for the 24-hour volumes.

TABLE 1 - 1% & 10% DESIGN FLOWS

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TABLE 1
UVAS CREEK
1% 10% DESIGN FLOWS
AND 1976 VALUES

UVAS 1% 3DUV3Q1.xls WO/HB 15% RTIMP R/TC+R=0.8, AMC=2.25 PRECIP @ A,B,C = LOMA PREITA							RECORDED		UVAS FLOWS 3UV3Q10 10% Uvas Creek 15% RTIMP, AMC=1.75 FAIR R/TC+R=0.6 OR AS NOTED					1976 UVAS 1% T INTERVAL = 30 MIN 2003 VALUES ARE HIGHER BECAUSE TCFOR 76 = 30 MIN, 15 MIN FOR 2003					
		P	T	AVE	A	LOCATION	1%	10%		P	T	AVE	A			p	T	AVE	A
OPERATION	STA	Q	P	24-HR	SQ.MI					Q	P	24	SM	OPERATION	STA	Q	P	24	SM
HYDROGRAPH AT +	1	8014	18.25	3532	20.63	UVAS @ USGS1539	7810	4711	1	4181	18.5	1822	20.63	HYDROGRAPH AT +	1	4785	19	2289	11.26
ROUTED TO +	2	8021	18.5	3532	20.63				2	4184	18.75	1822	20.63	HYDROGRAPH AT +	1	4353	19	1993	11.26
HYDROGRAPH AT +	2	3702	18	1541	9.5	UVAS @ UVAS DAM			2	1978	18	630	9.5	ROUTED TO +	1	4353	19	1993	11.26
ROUTED TO +	2	3702	18	1541	9.5				2	1978	18	630	9.5	HYDROGRAPH AT +	4	1367	18.5	599	2.93
2 COMBINED AT +	2	11523	18.5	5072	30.13	RESERVOIR INFLOW USGS154000	14500	7320	2	5891	18.5	2451	30.13	HYDROGRAPH AT +	4	1379	18.5	541	2.93
ROUTED TO +	2	8932	20	3521	30.13	OUTFLOW			2	2671	25.25	917	30.13	ROUTED TO +	4	1379	18.5	541	2.93
ROUTED TO +	3	8931	20.25	3520	30.13				3	2672	25.5	917	30.13	ROUTED TO +	1	1134	19	538	2.93
HYDROGRAPH AT +	3	1302	18	559	3.92	INTER UVAS @3			3	668	17.75	176	3.92	2 COMBINED AT +	1	5487	19	2532	14.19
ROUTED TO +	3	1302	18	559	3.92				3	668	17.75	176	3.92	ROUTED TO +	3	5392	19	2531	14.19
2 COMBINED AT +	3	9940	20.25	3962	34.05	UVAS D/S SYCAMORE			3	2749	25.25	1028	34.05	HYDROGRAPH AT +	2	1524	18.5	690	3.63
ROUTED TO +	4	9929	20.25	3962	34.05				4	2748	25.5	1028	34.05	HYDROGRAPH AT +	2	1530	18.5	604	3.63
HYDROGRAPH AT +	4	886	18	372	2.92	INTER UVAS U/S L. ARTHUR			4	384	17.75	99	2.92	ROUTED TO +	2	1530	18.5	604	3.63
ROUTED TO +	4	886	18	372	2.92				4	384	17.75	99	2.92	ROUTED TO +	3	1249	19	601	3.63
2 COMBINED AT +	4	10622	20.25	4298	36.97	UVAS U/S L. ARTHUR			4	2795	25.5	1114	36.97	HYDROGRAPH AT +	3	1328	18.5	604	3.53
HYDROGRAPH AT +	4	2627	18.5	1404	9.19	LITTLE ARTHUR	2810	1630	4	1645	18.25	646	9.19	HYDROGRAPH AT +	3	1499	18.5	556	3.53

TABLE 2

UVAS CREEK
1% 10% DESIGN FLOWS

				FINAL UVAS 1, 10, 0.5, 50 % DESIGN FLOODS RTIMP 15%						FINAL UVAS 1, 10, 0.5, 50 % 24-HR VOLUMES RTIMP 15%					
LOCATION			A	P 1%	P 10%	SD	M	0.50%	50%	V 1%	V 10%	SD	M	0.50%	50%
	OPERATION	STA	SQ.MI	Q	Q	PEAK	PEAK	Q	Q	24-HR	24	V	V	V	V
UVAS @ USGS1639	HYDROGRAPH AT +	1	20.63	8014	4181	0.41554	3.122629	9131	1459	3532	1822	0.42275	2.753244	4034	624
	ROUTED TO +	2	20.63	8021	4184	0.41564	3.122821	9139	1459	3532	1822	0.42275	2.753244	4034	624
UVAS @ UVAS DAM	HYDROGRAPH AT +	2	9.5	3702	1978	0.40031	2.815855	4198	717	1541	630	0.57127	2.113819	1844	148
	ROUTED TO +	2	9.5	3702	1978	0.40031	2.815855	4198	717	1541	630	0.57127	2.113819	1844	148
RESERVOIR INFLOW USGS154000	2 COMBINED AT +	2	30.13	11523	5891	0.42849	3.255995	13183	1989	5072	2451	0.46446	2.831986	5869	755
OUTFLOW	ROUTED TO +	2	30.13	8932	2671	0.77099	2.501483	11379	379	3521	917	0.85926	1.931258	4612	104
	ROUTED TO +	3	30.13	8931	2672	0.77068	2.502018	11377	379	3520	917	0.85908	1.931475	4610	104
INTER UVAS @3	HYDROGRAPH AT +	3	3.92	1302	668	0.42623	2.313304	1488	227	559	176	0.73809	1.359808	705	27
	ROUTED TO +	3	3.92	1302	668	0.42623	2.313304	1488	227	559	176	0.73809	1.359808	705	27
UVAS D/S SYCAMORE	2 COMBINED AT +	3	34.05	9940	2749	0.8209	2.454095	12863	343	3962	1028	0.86165	1.978014	5193	116
	ROUTED TO +	4	34.05	9929	2748	0.82042	2.454507	12847	344	3962	1028	0.86165	1.978014	5193	116
	HYDROGRAPH AT														

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1% 10% DESIGN FLOWS
COMPARED WITH 1976 VALUES

ROUTED TO +	4	2627	18.5	1404	9.19	U/S UVAS, SC65			4	1645	18.25	646	9.19	ROUTED TO +	3	1499	18.5	556	3.53
2 COMBINED AT +	4	13072	20	5668	46.16	UVAS D/S LITTLE ARTHUR			4	3649	24.75	1713	46.16	2 COMBINED AT +	3	2658	18.5	1156	7.16
ROUTED TO +	6	13060	20.25	5667	46.16				6	3646	25	1713	46.16	2 COMBINED AT +	3	7825	19	3687	21.35
HYDROGRAPH AT +	6	243	17.5	71	0.6				6	109	17.5	17	0.6	ROUTED TO +	7	7863	19	3686	21.35
ROUTED TO +	6	248	18	71	0.6				6	103	18	17	0.6	HYDROGRAPH AT +	7	1288	18.5	647	3.86
HYDROGRAPH AT +	6	140	18.75	72	0.74				6	45	18.5	14	0.74	HYDROGRAPH AT +	7	1435	18.5	520	3.86
HYDROGRAPH AT +	6	100	17.5	23	0.13				6	70	17.5	15	0.13	ROUTED TO +	7	1435	18.5	520	3.86
2 COMBINED AT +	6	207	17.5	90	0.87				6	97	17.5	29	0.87	2 COMBINED AT +	7	8820	19	4206	25.21
2 COMBINED AT +	6	415	18	161	1.47	INTER UVAS U/S BODFISH			6	168	18	46	1.47	HYDROGRAPH AT +	7	1694	18.5	709	3.69
2 COMBINED AT +	6	13338	20.25	5824	47.63	UVAS U/S BODFISH			6	3697	24.75	1754	47.63	HYDROGRAPH AT +	7	1650	18.5	644	3.69
HYDROGRAPH AT +	6	411	18.75	215	1.84				6	274	18.25	109	1.84	ROUTED TO +	7	1650	18.5	644	3.69
ROUTED TO +	6	410	19	215	1.84				6	272	18.75	109	1.84	HYDROGRAPH AT +	7	709	18.5	286	1.56
HYDROGRAPH AT +	6	81	18.5	42	0.34				6	38	18.25	12	0.34	HYDROGRAPH AT +	7	835	18.5	284	1.56
HYDROGRAPH AT +	6	50	17.5	12	0.06				6	35	17.5	8	0.06	ROUTED TO +	7	835	18.5	284	1.56
2 COMBINED AT +	6	115	17.5	51	0.4				6	61	17.5	19	0.4	2 COMBINED AT +	7	2485	18.5	927	5.25
2 COMBINED AT +	6	503	19	265	2.24	BURCHEL U/S UVAS			6	316	18.75	128	2.24	2 COMBINED AT +	7	11151	18.5	5125	30.46
2 COMBINED AT +	6	13823	20.25	6088	49.87	UVAS U/S BODFISH, D/S BURCHEL			6	3854	24.75	1861	49.87	ROUTED TO +	7	7811	21	3459	30.46
HYDROGRAPH AT +	5	2826	18.25	1382	10.18	BODFISH @	2000	952	5	1456	18	429	10.18	ROUTED TO +	8	7728	21.5	3457	30.46

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ROUTED TO +	6	2831	18.5	1382	10.18	USGS 154100	6	1469	18.5	429	10.18	HYDROGRAPH AT +	8	895	18.5	361	2.05
HYDROGRAPH AT +	6	981	17.75	372	2.89	INTER BIDFISH U/S UVAS	6	431	17.75	95	2.89	HYDROGRAPH AT +	8	995	18.5	346	2.05
ROUTED TO +	6	983	18	372	2.89		6	428	18	96	2.89	ROUTED TO +	8	995	18.5	346	2.05
HYDROGRAPH AT +	6	127	18.5	64	0.59		6	44	18.25	14	0.59	2 COMBINED AT +	8	8074	21.5	3661	32.51
HYDROGRAPH AT +	6	82	17.5	19	0.1		6	58	17.5	12	0.1	ROUTED TO +	9	7753	22.5	3656	32.51
2 COMBINED AT +	6	181	17.5	79	0.69		6	86	17.5	26	0.69	HYDROGRAPH AT +	9	1767	19	784	4.74
2 COMBINED AT +	6	1134	18	451	3.58		6	490	18	121	3.58	HYDROGRAPH AT +	9	1953	19	735	4.74
2 COMBINED AT +	6	3920	18.5	1830	13.76	BODFISH U/S UVAS	6	1921	18.25	549	13.76	ROUTED TO +	9	1953	19	735	4.74
2 COMBINED AT +	6	17236	20	7900	63.63	UVAS D/S BODFISH	6	4992	18.5	2401	63.63	2 COMBINED AT +	9	8585	22	4157	37.25
ROUTED TO +	7	17215	20	7899	63.63		7	4927	18.5	2401	63.63	HYDROGRAPH AT +	10	1875	18.5	851	4.58
HYDROGRAPH AT +	7	202	17.75	68	0.55		7	106	17.5	19	0.55	HYDROGRAPH AT +	10	1795	18.5	723	4.58
ROUTED TO +	7	202	17.75	68	0.55		7	106	17.5	19	0.55	ROUTED TO +	10	1795	18.5	723	4.58
HYDROGRAPH AT +	7	32	18	13	0.12		7	11	17.75	3	0.12	ROUTED TO +	9	1496	19	720	4.58
HYDROGRAPH AT +	7	282	17.5	64	0.36		7	200	17.5	43	0.36	HYDROGRAPH AT +	9	1852	18.5	836	4.88
2 COMBINED AT +	7	310	17.5	76	0.48		7	209	17.5	46	0.48	HYDROGRAPH AT +	9	1954	18.5	754	4.88
ROUTED TO +	7	145	18	76	0.48		7	104	17.75	46	0.48	ROUTED TO +	9	1954	18.5	754	4.88
2 COMBINED AT +	7	347	17.75	143	1.03	INTER UVAS (J) U/S AUSLEY	7	206	17.5	65	1.03	2 COMBINED AT +	9	3354	18.5	1472	9.46
2 COMBINED AT +	7	17447	20	8027	64.66	UVAS U/S AUSLEY	7	5080	18.5	2451	64.66	2 COMBINED AT +	9	10414	21.5	5328	46.71

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HYDROGRAPH AT +	7	410	17.75	136	1.39	AUSLEY U/S UVAS	7	138	17.5	30	1.39
ROUTED TO +	7	410	17.75	136	1.39		7	138	17.5	30	1.39
2 COMBINED AT +	7	17706	20	8159	66.05	UVAS D/S AUSLEY	7	5170	18.5	2479	66.05
ROUTED TO +	8	17695	20.25	8159	66.05		8	5150	18.75	2479	66.05
HYDROGRAPH AT +	8	74	17.5	20	0.23		8	20	17.5	3	0.23
ROUTED TO +	8	74	17.75	20	0.23		8	19	18	3	0.23
HYDROGRAPH AT +	8	101	18	39	0.4		8	31	17.75	7	0.4
HYDROGRAPH AT +	8	296	17.5	68	0.4		8	207	17.5	45	0.4
2 COMBINED AT +	8	387	17.5	104	0.8		8	234	17.5	52	0.8
2 COMBINED AT +	8	443	17.5	124	1.03	INTER UVAS (L)	8	244	17.5	55	1.03
2 COMBINED AT +	8	17880	20.25	8270	67.08	UVAS U/S 8 MCCUTCHIN	8	5234	18.75	2519	67.08
HYDROGRAPH AT +	8	249	17.75	83	0.78	MCCUTCHIN U/S UVAS	8	101	17.5	20	0.78
ROUTED TO +	8	249	17.75	83	0.78		8	101	17.5	20	0.78
2 COMBINED AT +	8	18024	20.25	8350	67.86	UVAS D/S MCCUTCHIN	8	5288	18.75	2539	67.86
ROUTED TO +	9	18010	20.25	8349	67.86		9	5205	18.75	2538	67.86
HYDROGRAPH AT +	9	39	17.75	13	0.14		9	12	17.5	2	0.14
HYDROGRAPH AT +	9	100	17.5	23	0.14		9	73	17.5	16	0.14
2 COMBINED AT +	9	137	17.5	35	0.28	INTER UVAS	9	85	17.5	18	0.28

ROUTED TO +	11	10283	22.5	5325	46.71
HYDROGRAPH AT +	11	1138	19	552	3.63
HYDROGRAPH AT +	11	1474	19	526	3.63
ROUTED TO +	11	1474	19	526	3.63
2 COMBINED AT +	11	10945	22	5791	50.34
HYDROGRAPH AT +	12	2690	18.5	1217	7.32
HYDROGRAPH AT +	12	2469	18.5	1015	7.32
ROUTED TO +	12	2469	18.5	1015	7.32
HYDROGRAPH AT +	12	1142	18	474	2.83
HYDROGRAPH AT +	12	1151	18	417	2.83
ROUTED TO +	12	1151	18	417	2.83
2 COMBINED AT +	12	3436	18.5	1432	10.15
ROUTED TO +	11	3024	19	1427	10.15
HYDROGRAPH AT +	11	1369	18.5	563	3.46
HYDROGRAPH AT +	11	1420	18.5	515	3.46
ROUTED TO +	11	1420	18.5	515	3.46
2 COMBINED AT +	11	4273	18.5	1939	13.61
2 COMBINED AT +	11	13644	19	7596	63.95

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2 COMBINED AT +	9	18059	20.25	8379	68.14	UVAS U/S RESERVOIR		9	5229	18.75	2551	68.14
HYDROGRAPH AT +	9	199	17.75	69	0.57	RES CANYON) U/S UVAS (O		9	115	17.5	26	0.57
ROUTED TO +	9	199	17.75	69	0.57			9	115	17.5	26	0.57
2 COMBINED AT +	9	18167	20.25	8442	68.71	UVAS D/S RESERVOIR USGS154200	16700 6600 REGULATED	9	5277	18.75	2572	68.71
ROUTED TO +	10	17989	20.5	8433	68.71			10	4964	19	2568	68.71
HYDROGRAPH AT +	10	30	17.75	9	0.1			10	9	17.5	1	0.1
HYDROGRAPH AT +	10	284	17.5	65	0.4			10	195	17.5	42	0.4
2 COMBINED AT +	10	315	17.5	74	0.5			10	204	17.5	43	0.5
ROUTED TO +	10	146	18	73	0.5			10	107	17.75	43	0.5
2 COMBINED AT +	10	18100	20.5	8493	69.21	UVAS U/S BABB		10	5047	19	2598	69.21
HYDROGRAPH AT +	10	249	17.5	76	0.7			10	104	17.5	18	0.7
ROUTED TO +	10	249	17.5	76	0.7			10	104	17.5	18	0.7
HYDROGRAPH AT +	10	14	17.75	5	0.05			10	4	17.5	1	0.05
HYDROGRAPH AT +	10	100	17.5	23	0.14			10	70	17.5	15	0.14
2 COMBINED AT +	10	114	17.5	27	0.19			10	74	17.5	16	0.19
2 COMBINED AT +	10	363	17.5	103	0.89			10	178	17.5	34	0.89
2 COMBINED AT +	10	18250	20.5	8587	70.1	BABB U/S UVAS		10	5107	19	2626	70.1
ROUTED TO +	11	18246	20.5	8586	70.1	UVAS D/S BABB		11	5086	19.25	2626	70.1

ROUTED TO +	13	13411	22	7574	63.95
HYDROGRAPH AT +	13	1664	18.5	733	5.11
HYDROGRAPH AT +	13	1828	18.5	668	5.11
ROUTED TO +	13	1828	18.5	668	5.11
2 COMBINED AT +	13	14244	21.5	8194	69.06
ROUTED TO +	14	14093	22.5	8171	69.06
HYDROGRAPH AT +	14	927	18.5	351	2.54
HYDROGRAPH AT +	14	1129	18.5	363	2.54
ROUTED TO +	14	1129	18.5	363	2.54
2 COMBINED AT +	14	14406	22.5	8484	71.6
ROUTED TO +	16	14392	22.5	8483	71.6
HYDROGRAPH AT +	16	345	19	138	1.06
HYDROGRAPH AT +	16	508	19	176	1.06
ROUTED TO +	16	508	19	176	1.06
2 COMBINED AT +	16	14544	22.5	8635	72.66
ROUTED TO +	18	14286	24	8593	72.66
HYDROGRAPH AT +	18	770	19.5	336	2.6
HYDROGRAPH AT +	18	1256	19.5	387	2.6

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1% 10% DESIGN FLOWS
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HYDROGRAPH AT +	11	133	17.5	41	0.41		11	50	17.5	9	0.41
ROUTED TO +	11	135	17.75	41	0.41		11	50	18	9	0.41
HYDROGRAPH AT +	11	24	17.75	8	0.09	Correct CN	11	7	17.75	1	0.09
HYDROGRAPH AT +	11	182	17.5	41	0.26		11	127	17.5	27	0.26
2 COMBINED AT +	11	205	17.5	49	0.35		11	134	17.5	29	0.35
2 COMBINED AT +	11	308	17.5	89	0.76	FARMAN U/S UVAS	11	161	17.5	37	0.76
2 COMBINED AT +	11	18372	20.5	8666	70.86	UVAS D/S GAVILAN	11	5141	19.25	2654	70.86
ROUTED TO +	12	18160	20.5	8652	70.86		12	4966	19.25	2649	70.86
HYDROGRAPH AT +	12	32	18	12	0.15		12	8	17.75	2	0.15
HYDROGRAPH AT +	12	403	17.5	92	0.6		12	282	17.5	60	0.6
2 COMBINED AT +	12	431	17.5	103	0.75		12	288	17.5	62	0.75
ROUTED TO +	12	202	18	103	0.75	UVAS (T) @101	12	157	17.75	62	0.75
2 COMBINED AT +	12	18319	20.5	8736	71.61	UVAS @ 101	12	5067	19.25	2691	71.61
ROUTED TO +	13	18298	20.75	8735	71.61		13	5052	19.25	2691	71.61
HYDROGRAPH AT +	13	59	18	23	0.26		13	16	17.75	4	0.26
HYDROGRAPH AT +	13	146	17.5	33	0.21		13	102	17.5	22	0.21
2 COMBINED AT +	13	198	17.5	54	0.47	UVAS (U) @ SPRR	13	116	17.5	26	0.47
2 COMBINED AT											

ROUTED TO +	18	1256	19.5	387	2.6
2 COMBINED AT +	18	14602	23.5	8925	75.26
HYDROGRAPH AT +	15	827	18.5	318	2.3
HYDROGRAPH AT +	15	994	18.5	318	2.3
ROUTED TO +	15	994	18.5	318	2.3
ROUTED TO +	17	803	19	317	2.3
HYDROGRAPH AT +	17	2183	19.5	967	6.39
HYDROGRAPH AT +	17	2672	19.5	982	6.39
ROUTED TO +	17	2672	19.5	982	6.39
HYDROGRAPH AT +	17	1138	18.5	497	3.55
HYDROGRAPH AT +	17	1379	18.5	475	3.55
ROUTED TO +	17	1379	18.5	475	3.55
2 COMBINED AT +	17	3587	19.5	1457	9.94
2 COMBINED AT +	17	4311	19.5	1774	12.24
ROUTED TO +	18	4176	19.5	1774	12.24
2 COMBINED AT +	18	16251	23	10480	87.5

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A. D. SAAH

UVAS CREEK
1% 10% DESIGN FLOWS
COMPARED WITH 1976 VALUES

+	13	18373	20.5	8783	72.08	UVAS @ SPRR	13	5086	19.25	2708	72.08
ROUTED TO +	13A	18366	20.75	8782	72.08		13A	5062	19.5	2708	72.08
HYDROGRAPH AT +	13A	152	18.75	79	0.94		13A	42	18.5	14	0.94
HYDROGRAPH AT +	13A	119	17.5	27	0.17		13A	83	17.5	18	0.17
2 COMBINED AT +	13A	234	17.5	101	1.11	URBAN W @ 13A U/S UVAS	13A	107	17.5	31	1.11
2 COMBINED AT +	13A	18535	20.75	8881	73.19	UVAS @ 13A	13A	5121	19.5	2733	73.19
HYDROGRAPH AT +	14	345	18	136	1.3		14	137	17.75	32	1.3
ROUTED TO +	14	347	18.5	136	1.3		14	137	18.5	32	1.3
HYDROGRAPH AT +	14	118	18	49	0.54		14	34	18	8	0.54
HYDROGRAPH AT +	14	257	17.5	59	0.36		14	179	17.5	39	0.36
2 COMBINED AT +	14	357	17.5	104	0.9		14	205	17.5	47	0.9
2 COMBINED AT +	14	584	17.5	237	2.2	FARMAN (V) @ 101	14	264	17.5	77	2.2
ROUTED TO +	13A	546	18	237	2.2		13A	225	18.25	77	2.2
2 COMBINED AT +	13A	18965	20.75	9110	75.39	UVAS @ 13A	13A	5315	19.5	2799	75.39
ROUTED TO +	15	18932	21	9109	75.39		15	5303	19.75	2799	75.39
HYDROGRAPH AT +	15	437	18.5	228	2.07		15	204	18.25	65	2.07
ROUTED TO +	15	437	18.5	228	2.07	RURAL W @ 15	15	204	18.25	65	2.07
2 COMBINED AT +	15	19326	20.75	9334	77.46	UVAS U/S TICK	15	5467	19.75	2861	77.46
HYDROGRAPH AT											

A. D. SAAH

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UVAS CREEK
1% 10% DESIGN FLOWS
COMPARED WITH 1976 VALUES

+	15	784	18	350	3.14	TICK U/S UVAS		15	353	18	94	3.14
ROUTED TO +	15	784	18	350	3.14			15	353	18	94	3.14
2 COMBINED AT +	15	19950	20.75	9673	80.6	UVAS D/S TICK		15	5701	19.75	2953	80.6
HYDROGRAPH AT +	15	1347	18.75	735	6.76	TAR U/S UVAS U/SPAJARO		15	638	18.5	213	6.76
ROUTED TO +	15	1347	18.75	735	6.76			15	638	18.5	213	6.76
2 COMBINED AT + 1	15	21227	20.75	10406	87.36	UVAS U/S PAJARO RIVER		15	6249	19.75	3161	87.36

TABLE 2 - 0/5%, 1%, 10%, 50% DESIGN FLOWS

TABLE 2

UVAS CREEK
1% 10% DESIGN FLOWS

				FINAL UVAS 1, 10, 0.5, 50 % DESIGN FLOODS RTIMP 15%						FINAL UVAS 1, 10, 0.5, 50 % 24-HR VOLUMES RTIMP 15%					
LOCATION			A	P 1%	P 10%	SD	M	0.50%	50%	V 1%	V 10%	SD	M	0.50%	50%
	OPERATION	STA	SQ.MI	Q	Q	PEAK	PEAK	Q	Q	24-HR	24	V	V	V	V
UVAS @ USGS1639	HYDROGRAPH AT +	1	20.63	8014	4181	0.41554	3.122629	9131	1459	3532	1822	0.42275	2.753244	4034	624
	ROUTED TO +	2	20.63	8021	4184	0.41564	3.122821	9139	1459	3532	1822	0.42275	2.753244	4034	624
UVAS @ UVAS DAM	HYDROGRAPH AT +	2	9.5	3702	1978	0.40031	2.815855	4198	717	1541	630	0.57127	2.113819	1844	148
	ROUTED TO +	2	9.5	3702	1978	0.40031	2.815855	4198	717	1541	630	0.57127	2.113819	1844	148
RESERVOIR INFLOW USGS164000	2 COMBINED AT +	2	30.13	11523	5891	0.42849	3.255995	13183	1989	5072	2451	0.46446	2.831986	5869	755
OUTFLOW	ROUTED TO +	2	30.13	8932	2671	0.77099	2.501483	11379	379	3521	917	0.85926	1.931258	4612	104
	ROUTED TO +	3	30.13	8931	2672	0.77068	2.502018	11377	379	3520	917	0.85908	1.931475	4610	104
INTER UVAS @3	HYDROGRAPH AT +	3	3.92	1302	668	0.42623	2.313304	1488	227	559	176	0.73809	1.359808	705	27
	ROUTED TO +	3	3.92	1302	668	0.42623	2.313304	1488	227	559	176	0.73809	1.359808	705	27
UVAS D/S SYCAMORE	2 COMBINED AT +	3	34.05	9940	2749	0.8209	2.454095	12863	343	3962	1028	0.86165	1.978014	5193	116
	ROUTED TO +	4	34.05	9929	2748	0.82042	2.454507	12847	344	3962	1028	0.86165	1.978014	5193	116
	HYDROGRAPH AT														

UVAS CREEK
1% 10% DESIGN FLOWS

INTER UVAS U/S L. ARTHUR	+	4	2.92	886	384	0.53397	1.943562	1048	99	372	99	0.84545	0.981092	485	12
	ROUTED TO +	4	2.92	886	384	0.53397	1.943562	1048	99	372	99	0.84545	0.981092	485	12
UVAS U/S L. ARTHUR	2 COMBINED AT +	4	36.97	10622	2795	0.85268	2.423162	13884	322	4298	1114	0.86233	2.012095	5635	125
LITTLE ARTHUR U/S UVAS, SC65	HYDROGRAPH AT +	4	9.19	2627	1645	0.29896	2.857411	2886	771	1404	646	0.49579	2.215289	1641	184
	ROUTED TO +	4	9.19	2627	1645	0.29896	2.857411	2886	771	1404	646	0.49579	2.215289	1641	184
UVAS D/S LITTLE ARTHUR	2 COMBINED AT +	4	46.16	13072	3649	0.81495	2.58423	16885	463	5668	1713	0.76422	2.316688	7206	247
	ROUTED TO +	6	46.16	13060	3646	0.81489	2.583946	16869	462	5667	1713	0.76411	2.316824	7204	247
	HYDROGRAPH AT +	6	0.6	243	109	0.51203	1.422992	285	30	71	17	0.91296	0.134903	95	2
	ROUTED TO +	6	0.6	248	103	0.5612	1.3394	296	25	71	17	0.91296	0.134903	95	2
	HYDROGRAPH AT +	6	0.74	140	45	0.72488	0.783362	176	7	72	14	1.04589	-0.108939	100	1
	HYDROGRAPH AT +	6	0.13	100	70	0.2278	1.571742	107	39	23	15	0.27299	0.848497	25	8
	2 COMBINED AT +	6	0.87	207	97	0.48412	1.405833	241	28	90	29	0.7233	0.594437	113	5
INTER UVAS U/S BODFISH	2 COMBINED AT +	6	1.47	415	168	0.57756	1.532241	498	39	161	46	0.8001	0.702638	207	6
	2 COMBINED AT														

TABLE 2

UVAS CREEK
1% 10% DESIGN FLOWS

UVAS U/S BODFISH	+	6	47.63	13338	3697	0.81947	2.584483	17253	463	5824	1754	0.76646	2.324279	7409	251
	HYDROGRAPH AT +	6	1.84	411	274	0.25896	2.127001	446	142	215	109	0.43384	1.516817	246	36
	ROUTED TO +	6	1.84	410	272	0.26208	2.120072	445	140	215	109	0.43384	1.516817	246	36
	HYDROGRAPH AT +	6	0.34	81	38	0.48338	0.999722	94	11	42	12	0.8001	0.119061	54	2
	HYDROGRAPH AT +	6	0.06	50	35	0.2278	1.270712	54	20	12	8	0.25896	0.592341	13	4
	2 COMBINED AT +	6	0.4	115	61	0.40495	1.299386	131	22	51	19	0.63061	0.522018	62	4
BURCHEL U/S UVAS	2 COMBINED AT +	6	2.24	503	316	0.29688	2.143427	552	149	265	128	0.46476	1.5495	307	39
UVAS U/S BODFISH, D/S BURCHEL	2 COMBINED AT +	6	49.87	13823	3854	0.81572	2.607046	17859	488	6088	1861	0.75695	2.361402	7722	273
BODFISH @ USGS 154100	HYDROGRAPH AT +	5	10.18	2826	1456	0.42355	2.654907	3228	498	1382	429	0.74713	1.735897	1747	65
	ROUTED TO +	6	10.18	2831	1469	0.419	2.664225	3229	508	1382	429	0.74713	1.735897	1747	65
INTER BIDFISH U/S UVAS	HYDROGRAPH AT +	6	2.89	981	431	0.52528	2.004139	1157	114	372	95	0.87179	0.931572	489	10
	ROUTED TO +	6	2.89	983	428	0.53104	1.994191	1161	111	372	96	0.86511	0.944145	488	11
	HYDROGRAPH AT +	6	0.59	127	44	0.67699	0.831068	157	8	64	14	0.97066	-0.01867	87	1
	HYDROGRAPH AT														

UVAS CREEK
1% 10% DESIGN FLOWS

	+	6	0.1	82	58	0.22116	1.498041	88	33	19	12	0.29349	0.726995	21	6
	2 COMBINED AT +	6	0.69	181	86	0.47526	1.364181	210	26	79	26	0.70978	0.563231	99	4
	2 COMBINED AT +	6	3.58	1134	490	0.53591	2.047107	1342	126	451	121	0.84028	1.074448	587	14
BODFISH U/S UVAS	2 COMBINED AT +	6	13.76	3920	1921	0.45553	2.736894	4523	606	1830	549	0.76894	1.816845	2330	78
UVAS D/S BODFISH	2 COMBINED AT +	6	63.63	17236	4992	0.79141	2.748577	22100	672	7900	2401	0.76064	2.467625	10032	349
	ROUTED TO +	7	63.63	17215	4927	0.79901	2.733775	22125	650	7899	2401	0.76056	2.467722	10030	349
	HYDROGRAPH AT +	7	0.55	202	106	0.41183	1.531108	230	37	68	19	0.81435	0.301538	88	2
	ROUTED TO +	7	0.55	202	106	0.41183	1.531108	230	37	68	19	0.81435	0.301538	88	2
	HYDROGRAPH AT +	7	0.12	32	11	0.682	0.222997	40	2	13	3	0.9365	-0.646682	17	0
	HYDROGRAPH AT +	7	0.36	282	200	0.21944	2.037702	302	115	64	43	0.25399	1.328683	69	23
	2 COMBINED AT +	7	0.48	310	209	0.25179	2.018001	336	110	76	46	0.32067	1.277954	84	20
	ROUTED TO +	7	0.48	145	104	0.21226	1.762325	155	61	76	46	0.32067	1.277954	84	20
INTER UVAS (J) U/S AUSLEY	2 COMBINED AT +	7	1.03	347	206	0.33303	1.914228	385	89	143	65	0.50356	1.208638	168	18
	2 COMBINED AT														

TABLE 2

UVAS CREEK
1% 10% DESIGN FLOWS

UVAS U/S AUSLEY	+	7	64.66	17447	5080	0.78803	2.760234	22346	690	8027	2451	0.75766	2.480149	10184	359
AUSLEY U/S UVAS	HYDROGRAPH AT +	7	1.39	410	138	0.69545	1.305341	510	24	136	30	0.96532	0.318737	184	3
	ROUTED TO +	7	1.39	410	138	0.69545	1.305341	510	24	136	30	0.96532	0.318737	184	3
UVAS D/S AUSLEY	2 COMBINED AT +	7	66.05	17706	5170	0.78622	2.770026	22665	705	8159	2479	0.76082	2.481288	10361	361
	ROUTED TO +	8	66.05	17695	5150	0.7883	2.765848	22666	699	8159	2479	0.76082	2.481288	10361	361
	HYDROGRAPH AT +	8	0.23	74	20	0.83559	0.298321	96	2	20	3	1.21163	-0.976835	29	0
	ROUTED TO +	8	0.23	74	19	0.86835	0.236733	97	2	20	3	1.21163	-0.976835	29	0
	HYDROGRAPH AT +	8	0.4	101	31	0.75435	0.586139	128	5	39	7	1.09701	-0.471314	55	0
	HYDROGRAPH AT +	8	0.4	296	207	0.22841	2.041874	318	116	68	45	0.26367	1.336807	74	23
	2 COMBINED AT +	8	0.8	387	234	0.32132	1.983636	428	104	104	52	0.44269	1.184774	120	17
INTER UVAS (L)	2 COMBINED AT +	8	1.03	443	244	0.3809	1.930306	499	93	124	55	0.5192	1.117317	146	15
UVAS U/S 8 MCCUTCHIN	2 COMBINED AT +	8	67.08	17880	5234	0.78461	2.777303	22876	717	8270	2519	0.75923	2.490151	10497	368
MCCUTCHIN U/S UVAS	HYDROGRAPH AT +	8	0.78	249	101	0.57629	1.312772	298	23	83	20	0.90889	0.210357	110	2
	ROUTED TO														

TABLE 2

UVAS CREEK
1% 10% DESIGN FLOWS

	+	8	0.78	249	101	0.57629	1.312772	298	23	83	20	0.90889	0.210357	110	2
UVAS D/S MCCUTCHIN	2 COMBINED AT +	8	67.86	18024	5288	0.78318	2.78348	23050	727	8350	2539	0.76033	2.492268	10602	370
	ROUTED TO +	9	67.86	18010	5205	0.79278	2.76508	23102	698	8349	2538	0.7605	2.491887	10601	369
	HYDROGRAPH AT +	9	0.14	39	12	0.75277	0.175858	49	2	13	2	1.19546	-1.133523	19	0
	HYDROGRAPH AT +	9	0.14	100	73	0.201	1.622128	107	44	23	16	0.23178	0.925988	25	9
INTER UVAS	2 COMBINED AT +	9	0.28	137	85	0.30486	1.563592	151	39	35	18	0.4247	0.745633	40	6
UVAS U/S RESERVOIR	2 COMBINED AT +	9	68.14	18059	5229	0.79158	2.768521	23156	703	8379	2551	0.75953	2.495272	10636	372
RES CANYON) U/S UVAS (O	HYDROGRAPH AT +	9	0.57	199	115	0.35023	1.640424	222	47	69	26	0.62335	0.666957	84	5
	ROUTED TO +	9	0.57	199	115	0.35023	1.640424	222	47	69	26	0.62335	0.666957	84	5
UVAS D/S RESERVOIR	2 COMBINED AT +	9	68.71	18167	5277	0.78955	2.774923	23280	714	8442	2572	0.75908	2.499375	10715	376
USGS154200	ROUTED TO +	10	68.71	17989	4964	0.82232	2.709052	23290	618	8433	2568	0.75939	2.498324	10704	375
	HYDROGRAPH AT +	10	0.1	30	9	0.76894	0.031515	38	1	9	1	1.4033	-1.683957	14	0
	HYDROGRAPH AT +	10	0.4	284	195	0.24012	2.001887	306	106	65	42	0.27892	1.288548	71	21
	2 COMBINED AT														

UVAS CREEK
1% 10% DESIGN FLOWS

	+	10	0.5	315	204	0.27747	1.976665	344	101	74	43	0.34671	1.217416	83	18
	ROUTED TO +	10	0.5	146	107	0.19848	1.791203	155	65	73	43	0.33802	1.227843	81	18
UVAS U/S BABB	2 COMBINED AT +	10	69.21	18100	5047	0.81565	2.724248	23385	639	8493	2598	0.7565	2.506836	10771	382
	HYDROGRAPH AT +	10	0.7	249	104	0.5576	1.347917	297	25	76	18	0.91991	0.151376	101	2
	ROUTED TO +	10	0.7	249	104	0.5576	1.347917	297	25	76	18	0.91991	0.151376	101	2
	HYDROGRAPH AT +	10	0.05	14	4	0.8001	-0.35806	18	1	5	1	1.0279	-1.233476	7	0
	HYDROGRAPH AT +	10	0.14	100	70	0.2278	1.571742	107	39	23	15	0.27299	0.848497	25	8
	2 COMBINED AT +	10	0.19	114	74	0.27599	1.538044	124	37	27	16	0.33418	0.803102	30	7
	2 COMBINED AT +	10	0.89	363	178	0.45513	1.704267	419	56	103	34	0.70788	0.682023	129	6
BABB U/S UVAS	2 COMBINED AT +	10	70.1	18250	5107	0.81338	2.732112	23562	650	8587	2626	0.75669	2.511271	10891	386
UVAS D/S BABB	ROUTED TO +	11	70.1	18246	5086	0.81587	2.727333	23575	643	8586	2626	0.75661	2.51136	10889	386
	HYDROGRAPH AT +	11	0.41	133	50	0.62483	0.949179	162	10	41	9	0.96844	-0.207889	56	1
	ROUTED TO +	11	0.41	135	50	0.63436	0.93774	165	10	41	9	0.96844	-0.207889	56	1
	HYDROGRAPH AT														

TABLE 2

UVAS CREEK
1% 10% DESIGN FLOWS

Corroct CN	+	11	0.09	24	7	0.78693	-0.09922	31	1	8	1	1.32807	-1.593688	12	0
	HYDROGRAPH AT +	11	0.26	182	127	0.22981	1.828037	196	71	41	27	0.26679	1.111211	45	14
	2 COMBINED AT +	11	0.35	205	134	0.27154	1.801254	223	67	49	29	0.335	1.060401	54	12
FARMAN U/S UVAS	2 COMBINED AT +	11	0.76	308	161	0.4143	1.709664	351	56	89	37	0.56057	0.895517	106	9
UVAS D/S GAVILAN	2 COMBINED AT +	11	70.86	18372	5141	0.8134	2.734973	23719	654	8666	2654	0.75576	2.516987	10988	391
	ROUTED TO +	12	70.86	18160	4966	0.8281	2.702285	23554	609	8652	2649	0.75593	2.515962	10970	390
	HYDROGRAPH AT +	12	0.15	32	8	0.88538	-0.15937	42	1	12	2	1.14434	-1.072178	17	0
	HYDROGRAPH AT +	12	0.6	403	282	0.22802	2.176621	433	158	92	60	0.27299	1.450557	100	30
	2 COMBINED AT +	12	0.75	431	288	0.25748	2.150419	467	150	103	62	0.32418	1.40337	114	27
UVAS (T) @101	ROUTED TO +	12	0.75	202	157	0.16096	2.00275	212	104	103	62	0.32418	1.40337	114	27
UVAS @ 101	2 COMBINED AT +	12	71.61	18319	5067	0.82081	2.719779	23706	633	8736	2691	0.75206	2.527445	11064	400
	ROUTED TO +	13	71.61	18298	5052	0.82197	2.717098	23688	629	8735	2691	0.75198	2.527533	11062	400
	HYDROGRAPH AT +	13	0.26	59	16	0.83343	0.204005	77	2	23	4	1.11716	-0.73853	33	0
	HYDROGRAPH AT														

TABLE 2

UVAS CREEK
1% 10% DESIGN FLOWS

	+	13	0.21	146	102	0.22905	1.733742	157	57	33	22	0.25896	1.031673	36	11
UVAS (U) @ SPRR	2 COMBINED AT +	13	0.47	198	116	0.34148	1.654681	220	49	54	26	0.46679	0.85482	63	8
UVAS @ SPRR	2 COMBINED AT +	13	72.08	18373	5086	0.8203	2.722017	23772	636	8783	2708	0.75146	2.530894	11121	403
	ROUTED TO +	13A	72.08	18366	5062	0.82308	2.71663	23784	629	8782	2708	0.75139	2.530981	11119	403
	HYDROGRAPH AT +	13A	0.94	152	42	0.82146	0.637495	197	5	79	14	1.10515	-0.180047	112	1
	HYDROGRAPH AT +	13A	0.17	119	83	0.2301	1.642957	128	46	27	18	0.25896	0.944523	29	9
URBAN W @ 13A U/S UVAS	2 COMBINED AT +	13A	1.11	234	107	0.49975	1.42968	274	30	101	31	0.75435	0.586139	128	5
UVAS @ 13A	2 COMBINED AT +	13A	73.19	18535	5121	0.82153	2.723523	23991	639	8881	2733	0.75268	2.533424	11249	406
	HYDROGRAPH AT +	14	1.3	345	137	0.58985	1.4289	415	31	136	32	0.9241	0.396228	182	3
	ROUTED TO +	14	1.3	347	137	0.59354	1.42447	418	30	136	32	0.9241	0.396228	182	3
	HYDROGRAPH AT +	14	0.54	118	34	0.79471	0.577826	151	5	49	8	1.15751	-0.485921	70	0
	HYDROGRAPH AT +	14	0.36	257	179	0.231	1.975653	276	100	59	39	0.26439	1.273793	64	20
	2 COMBINED AT +	14	0.9	357	205	0.35429	1.886611	399	84	104	47	0.50726	1.063388	122	13
	2 COMBINED AT														

11/4/2003

TABLE 2

A. D. SAAH

UVAS CREEK
1% 10% DESIGN FLOWS

FARMAN (V) @ 101	+	14	2.2	584	264	0.50707	1.813118	685	73	237	77	0.71803	1.02486	297	12
	ROUTED TO +	13A	2.2	546	225	0.56619	1.672753	652	54	237	77	0.71803	1.02486	297	12
UVAS @ 13A	2 COMBINED AT +	13A	75.39	18965	5315	0.81243	2.750592	24478	678	9110	2799	0.7537	2.542564	11543	414
	ROUTED TO +	15	75.39	18932	5303	0.81276	2.749213	24437	676	9109	2799	0.75363	2.542648	11542	415
	HYDROGRAPH AT +	15	2.07	437	204	0.48655	1.725775	509	59	228	65	0.8015	0.851111	293	9
RURAL W @ 15	ROUTED TO +	15	2.07	437	204	0.48655	1.725775	509	59	228	65	0.8015	0.851111	293	9
UVAS U/S TICK	2 COMBINED AT +	15	77.46	19326	5467	0.80646	2.769997	24897	708	9334	2861	0.75522	2.550253	11833	422
TICK U/S UVAS	HYDROGRAPH AT +	15	3.14	784	353	0.50962	1.936231	920	97	350	94	0.83962	0.965586	456	11
	ROUTED TO +	15	3.14	784	353	0.50962	1.936231	920	97	350	94	0.83962	0.965586	456	11
UVAS D/S TICK	2 COMBINED AT +	15	80.6	19950	5701	0.79999	2.795965	25648	751	9673	2953	0.75779	2.560914	12272	433
TAR U/S UVAS U/SPAJARO	HYDROGRAPH AT +	15	6.76	1347	638	0.47727	2.232091	1565	190	735	213	0.79104	1.379131	942	29
	ROUTED TO +	15	6.76	1347	638	0.47727	2.232091	1565	190	735	213	0.79104	1.379131	942	29
UVAS U/S PAJARO RIVER	2 COMBINED AT +	15	87.36	21227	6249	0.781	2.858614	27128	863	10406	3161	0.76097	2.586661	13215	460

2 GENERAL INFORMATION

2.1 AUTHORIZATION

The hydrology of Uvas Creek study was authorized by SCVWD in 2002 to update the previous hydrology studies that were done on the creek.

2.2 UVAS CREEK WATERSHED

Uvas Creek drains a watershed (Map-2) that extends from the upper heights of Mount Loma Preita in Santa Cruz Mountains to the lower agricultural plains of South Santa Clara County. The watershed is approximately 26 miles long and 6 miles wide. The total area of the watershed is approximately 87 square miles.

The upper 30 square miles of the watershed are regulated by Uvas Reservoir, which was built in 1957. The Reservoir impounds a maximum pool of 10,000 acre-ft. All relevant maps for this study are shown in the map section at the end of the report including the Location Map and the Watershed Map,

Uvas Creek flows in a southeasterly direction parallel to Llagas Creek, with tributaries flowing into it from Santa Cruz Mountains. While the northern part of Santa Clara County drains into San Francisco Bay, Uvas Creek drains into the environmentally sensitive and remote coast of Monterey Bay through the Pajaro River. Table 3 below illustrates the relative size of Uvas watershed (87 square mile) as compared to the other much larger Pajaro River drainage basins.

TABLE 3 - Watershed Areas along Pajaro River--Points of Reference

Location	Drainage Area
Pajaro upstream of Llagas Creek	196 square miles
Pajaro down stream of Llagas Creek	300 square miles
Pajaro at Sargent u/s San Benito River	500 square miles
Pajaro at Chittenden downstream of San Benito River	1,186 square miles
Pajaro at Watsonville upstream of Monterey Bay	1,273 square miles

3 PREVIOUS STUDIES

3.1 GENERAL

The hydrology of Uvas Creek was first studied in 1978 based on the precipitation data and regression equations that were available at that time. The following is a discussion of the previous work.

3.2 PREVIOUS PRECIPITATION MODEL

The precipitation model used in the above mentioned study (2) was developed in the late sixties using the sparse recorded data that were available at that time. It was recently noticed that the results from the previous rainfall model were higher than the more contemporary models. However, the balancing of rainfall-generated flows with quantiles obtained from regression, reduced the uncertainty of results.

That rainfall model was used extensively prior to 1996 when more contemporary models were developed.

3.3 THE 1976 REGIONAL REGRESSION EQUATIONS

Using available streamflow data from and around Santa Clara County, including most of the data within Uvas Creek watershed, the SCVWD developed the 1976 regional regression equations (4) for the statistics of instantaneous flood peaks and volumes.

Those equations were obtained by regressing the quantiles of flood peaks and volumes of recorded data to the respective watershed and rainfall characteristics. The results of the regression study were compiled in a report (4) that was reviewed by a panel of expert hydrologists and used to develop the SCVWD Design Flood Flows Manual.

3.4 1978 SCVWD HYDROLOGY STUDY

In 1978, SCVWD conducted a hydrologic analysis (6) using the USACE's HEC-1 program and the statistically based regression equations to determine the design flood flows. HEC-1 program is a single storm watershed model that is designed to generate flood flow of a certain probability from a precipitation volume of the same probability. To avoid the complexity of compounded probability issues that could result from combining probabilistic rainfall events with other probabilistic watershed conditions (such as the probabilities of reservoir volumes being at a certain level, watersheds wetness etc.), the SCVWD balanced the resulting flood peaks and volumes from HEC-1 with flood peaks and volumes derived from the statistically based 1976 regional regression equations mentioned above. The resulting design flood flows of that study are shown for comparison in Table 1.

3.5 UVAS RESERVOIR

Uvas Reservoir is located in the upper reaches of Uvas Creek Basin (Watershed Map Of Uvas Creek). The current maximum capacity of the reservoir is equal to 9945 ac-ft, while in the 1978 study the maximum capacity was equal to 9869 ac-ft. This correction was made as a result of a new survey of the reservoir site. The new capacity required an adjustment of the incidental initial storage that was equal to 6850 ac-ft, rather than the previous value of 6800 ac-ft.

The dam was built in 1957 at a location seventeen miles upstream of the confluence of Uvas Creek with Pajaro River, perhaps due to the 1955 flood that generated 14000 cfs at Highway 101.

4 UPDATED SCVWD REGRESSION EQUATIONS

4.1 GENERAL

The hydrology methods of SCVWD were updated periodically to include the latest continuous time series of rainfall and runoff data. This updating included the generation of regional regression equations for flood flows and rainfall maximum annuals. The new rainfall quantiles obtained from those equations are used as HEC-1 input, while the flood quantiles are used to calibrate the resulting flows. Two separate updates of flood flow regression models were done: one in 1996 and the other in 2003. The following is a discussion of those updates together with a discussion of the hydrology of Uvas watershed.

4.2 1996 REGRESSION MODEL, RAINFALL AND STREAMFLOW

In the early 1990s it was thought that the previous (pre-1976) precipitation and stream flow data may not explain the current hydrologic processes for Santa Clara County. Comprehensive precipitation and stream flow data compilations and analyses were conducted. The data from 300 precipitation and 100 stream-flow gaging stations within the seven Bay Area counties were analyzed and mathematical models were developed. For precipitation, the Return Period-Duration-Specific (TDS) equations were developed for each duration and probability of occurrence. These equations, being numerous to handle, were further aggregated to generate the Global Equations. Although either of these equations could be used to generate rainfall design quantiles, the TDS equations were chosen for use in this study. The Global and TDS equations are discussed in reference (12).

Similarly, the 1996 stream flow quantiles discussed above (11) were compared with those calculated from the 1976 study. After extensive testing, it was determined that the 1976 quantiles were providing more stable and consistent results. This was explained by the following:

1 The original area of coverage for the 1996 multiplicative, statistically-based and linear models include all of San Francisco and Monterey Bay regions, which is too wide of an application for the small urban areas in Santa Clara County.

2 These 1996 mathematical models were developed with a best-fit technique of the dependent and all independent variables included. Such best-fit equations include variables like the slopes, basin factors and others that render such equation unstable due to the difficulty in determining these variables. The 1976 model (4), however, was developed using data from Santa Clara County and a step-wise multiple linear regression model that generate equations with different combination and cancellation of independent variables until the best fit is defined.

3 The final statistics (means, standard deviations and quantiles) that were used in the 1996 study were the weighted averages of statistics obtained from many traces of stochastic data each with lengthy time series of stochastic and recorded data points. This wide regionalization proved to be hardly applicable to the small urban and rural sub-areas in Santa Clara County.

4.3 2003 STREAMFLOW REGRESSION MODEL

In 2003, it was determined that the 1976 and the 1996 regression models needed to be updated to include recent data. As a result, SCVWD authorized a study to upgrade the models to include the data through 2000 based on the following criteria:

1 Use the historic data only. No stochastic data should be included.
2 Use the data from Santa Clara and Santa Cruz only.
3 The data through 2000 should be used.
4 Regress the quantiles only and not the statistics.

Using the above criteria the statistics and quantiles obtained from 42 stations, were regressed against basin and rainfall characteristics of respective watersheds to obtain regression models (17) similar to those developed in 1976. A comparison (Appendix 1) was made to evaluate the applicability of the 2003 model against the 1996 and 1976 models. With very high determinations and very low standard errors of estimate for the peaks and volumes, it was shown that the 2003 model was clearly more credible. The equations for the peaks and volumes for both the 1% and 10% quantiles are shown below:

PEAKS:

$$Q1\% = 11.22 * A^{0.954} * P^{1.03}$$

$$R^2 = 0.964$$
$$S.E. = 0.145$$

$$Q10\% = 2.985 * A^{0.988} * P^{1.173}$$

$$R^2 = 0.947$$
$$S.E. = 0.185$$

Where:
A = Watershed area in Sq. Mi.
P = Mean annual precipitation

VOLUMES:

$$V1\% = 2.254 * A^{0.964} * P^{1.187}$$

$$R^2 = 0.927$$
$$S.E. = 0.133$$

$$V10\% = 0.895 * A^{0.933} * P^{1.244}$$

$$R^2 = 0.93$$
$$S.E. = 0.197$$

Where:
A = Watershed area in Sq. Mi.
P = Mean annual precipitation

The data used in the 2003 study includes most of the useable stations in Uvas Creek watershed as well as many other stations from the immediate areas. It was prudent therefore, to assume that the results from such a model are adequately applicable to ungaged sub-areas in this study.

5 UVAS CREEK HYDRLOGIC ANALYSIS

This contemporary hydrologic analysis of Uvas Creek watershed was authorized by SCVWD to include the application of the 2003 regression equations mentioned above.

5.1 WATERSHEDS AND SUB-WATERSHEDS

As stated earlier, Uvas Creek watershed is gaged by five streamflow and three precipitation stations. It is also urbanized in the lower parts, regulated by Uvas Creek reservoir, and the lower watershed is quickly changing from agricultural land uses to urban conditions. This complex watershed warrants careful consideration to address its specific characteristics. The USACE HEC-1 program was selected as an appropriate tool to address the watershed complexities and to estimate design flows for flood control improvements.

The Watershed Map 2 shows the limits of the study area and the delineation of pertinent rural and urban sub-watersheds. The Map Section of this report includes: the Location Map 1, the Watershed Map 2, the Storm Drains Map 3, the Land Use Map 4, and the Hydrologic Soil Map 5. In addition, the map section also shows the mean annual precipitation isolines in inches, the locations of gaging stations, the size of each sub-watershed in square miles and the names of all major creeks and other features.

5.2 URBANIZATION AND ITS CONSIDERATION

In the past thirty years, Santa Clara County has experienced rapid urban growth fueled by the growth of the computer industry. However, urban developments in the South County, which include Uvas and Llagas Creek Basins, have stayed behind the northern county growth pattern. The agricultural nature of the South was mainly retained, in part, due to the lack of adequate drainage facilities to convey floodwater as well as the ability to discharge the sewage effluent, especially under increased urbanization conditions, to Monterey Bay. Nevertheless, with the increased demand for housing and industrial growth, urbanization has spread to the Uvas Creek Basin, especially around the City of Gilroy.

Although the 1978 hydrologic analysis included no urban growth condition, the assumption of urban growth in this study is based on the General Plans of the various jurisdictions, as well as the 2050 expected projection of urban growth. The delineation of the 2050-projected urban growth was based on the limited information provided by the County and other local communities. The County envisions a "no growth" policy in the South while the city of Gilroy had no information about the distant projection of urban growth. Furthermore, any growth potential in the South County could be restricted by the lack of sewage treatment facilities and effluent disposal capabilities. The sewage effluent from new developments in the Uvas and Llagas basins would be discharged into Pajaro River and Monterey Bay. This route is politically and environmentally very sensitive and therefore, could limit the projection of urban growth for many years. In addition, the City of Gilroy was reluctant to define any 2050 boundaries that are not a part of the City's General Plan.

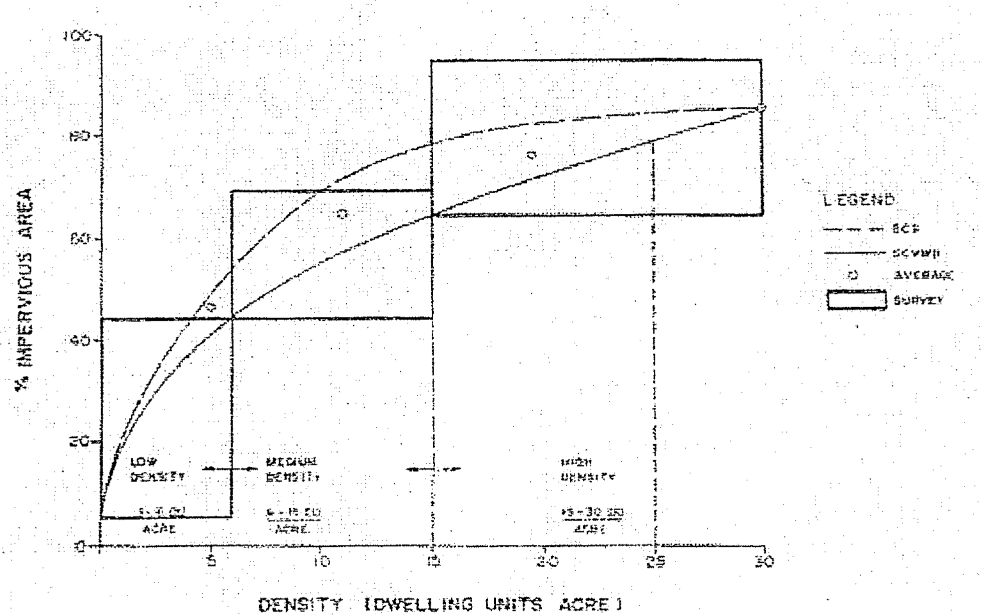
For these reasons, it was deemed necessary that the 2050 urban growth projection should be based on a logical pattern of assumptions such as the following:

1. The boundary of 2050 growth would be limited to an approximate ground elevation of 400 ft as shown on the USGS 7.5 minute quad maps, except at locations that are very difficult to control due to the hilly terrain, especially west of Gilroy.
2. The boundary of growth would be limited by the availability of existing rural roads in

areas with relatively mild slopes.
3. The density of development (stated as 15%) would actually vary from 20% in areas closer to Gilroy and 15% in other areas. These densities are low because of the limited sewage treatment capacity.

A full size map of existing land uses in the watershed together with the 2050 projection line is shown on MAP- 2 of the Map Section.

One obvious result of urbanization is increased imperviousness of land surfaces. Impervious surfaces, such as streets, parking lots, buildings and other hardened areas, prevent the water from infiltrating into the ground. This in turn effects flood timing, peak and volumes magnitudes, flow velocity and other additional factors, such as water quality. Figure 1 below illustrates the general relationship between dwelling unit density and percent imperviousness (6, 8, 15). The urban sub-watersheds were further divided into rural and urban sub-sub watersheds. In addition, the urban sub-sub-watersheds were divided into pervious and impervious parts based on the ratio of imperviousness (RTIMP) of 15% as calculated in Appendix 1. This Appendix includes tables that show 15% RTIMP for each sub-watershed together with all basin characteristics.



Ratio of impervious area versus dwelling density.

Figure 1. Ratio of Impervious Area Versus Dwelling Density

6 HYDROLOGIC MODEL

6.1 GAGED AND UN-GAGED WATERSHEDS AND THE USE OF 2003 MODEL

As mentioned earlier, there are five stream-flow gaging stations in the Uvas Creek watershed. Three of these are USGS stations and two are SCVWD stations. Table 4 compiles the information from these stations and shows the various quantiles of recorded data as they compare to some quantiles from regression:

Name of station	Station #	Drainage Area	MAP	# Years /Last Yr	0.5%	1%	10%	50%	Notes	REG is
Uvas Above. Dam	153900	21	41	21/1982	8260	7810	5530	2690	Record	High used
						9388	4711		Regreg	
Uvas Nr. M.H.	154000	30	17	27/1957	16700	14500	7320	2560	Record	Low
				Un Regulate		12862	6510		Regreg	
Uvas Nr. Gilroy	154200	70	34	32/1992	18700	15700	6600	1620	Record	V high
				Regulate		24414	12427		Regreg	
Little Arthur	SC65	9.2	34	NA	3090	2810	1630	562	Record	OK used
						3183	1476		Regreg	
Bodfish Creek	15410SC	10.2	28	NA	2300	2000	952	245	Record	High used
						3523	1674		Regreg	

Table 4. Analysis of Data from USGS and SC Stations

The table also shows that, only three out of 5 stream-flow gaging stations within the Uvas Creek watershed were used in the 2003 regression; stations 153900, SC65 and 15410. Station 154000, however, has 27 years of record all of them before the reservoir was built, was not used in the regression but is now used for testing regression results. In addition, station 154200 is located downstream of the dam and started collecting record after the dam was erected. The data are subject to Uvas Dam operations and, therefore, are not considered normal, homogeneous or consistent. Such data could not be used for this type of statistical analysis.

The calculated quantile from station 154000 are less than the results of regression while other stations have mixed results; some lower and some higher. Considering the variability of recorded data and the difficulties in defining moments of higher order for small number of recorded data, it was determined that the results form the 2003 regression (17), produced more consistent results at all locations and therefore, should be used for calibration, albeit, with slightly more conservative results.

6.2 PRECIPITATION-DEPTH-DURATION-FREQUENCY ANALYSIS

In addition to gaging stations within the watershed, statistical analyses were conducted to include all precipitation stations within this hydrometeorologic region. Several mathematical functions that identify the quantiles of precipitation volumes and intensities for both long and short duration data were defined (12). For this study, the Return Period-Duration-Specific TDS or the Global equations could be used as discussed earlier. However, the TDS regression equation shown below was adopted to calculate precipitation input quantiles to the HEC-1 program. This TDS equation greatly improved the calculation of rainfall quantiles over the previous precipitation models discussed above. Appendix 1 includes, among other data, the results from the application of this equation as they compare with results from recorded data and other methods. The TDS regression equation is shown below:

$$X_{T,D} = A_{T,D} + B_{T,D} * MAP$$

Where:

X = *log of precipitation depth in inches,*
$_T$ = *return period in years,*
$_D$ = *duration in hours for short duration data and in days for long duration data,*
MAP = *log of mean annual precipitation in inches,*
A *and* B = *regression constants and coefficients that are unique to each precipitation quantile.*

The following table shows the values of the parameters *A* and *B* for the 24-Hr volumes:

Return Period (yr)	***A***	***B***	**Determination Coefficient (R^2)**	**Standard error (SDE)**
200	0.8812	0.2667	0.765	1.2928
100	0.8140	0.2434	0.788	1.105
10	0.5670	0.1626	0.870	0.5774
2	0.3142	0.0963	0.863	0.356

Note: Reference 12, Appendix B, Table B.1

The applicability of these equations was tested with excellent results as will be shown later.

6.3 RECORDED RAINFALL DATA

Using the above-mentioned precipitation model together with the calculated mean annual precipitation as an independent variable, rainfall quantiles were calculated for all watersheds. The results were then tested against the quantiles from recorded data at the following gaging stations: San Jose # 86, Morgan Hill # 62, Anderson # 41, Uvas # 104, Loma Preita # 44, and Castro Valley # 15. As presented in Appendix-4 of the Llagas Creek Hydrologic Investigation Report (18), the testing proved that the model results are compatible with those obtained from recorded data and therefore it was then used to calculate rainfall volumes for this study.

6.4 LOSS RATES

Loss rates for the rural and pervious parts of sub-watersheds were calculated using the SCS Curve Number (CN) method. For all impervious areas, minimal loss rates were assumed. The Hydrologic Soil Type, the Antecedent Moisture Content (AMC) and the ground cover were defined for each sub-watershed and used to determine the respective Initial Abstraction (Ia) and the CN for AMC II representing average watershed conditions. The actual AMC for various watershed conditions and various frequencies of occurrences were later determined based on the final calibration between flood volumes obtained from rainfall and that obtained from regression. Based on this information, the final Ia and CN values were calculated as an input into the HEC-1 model. Appendix 1 shows the various loss rate parameters, Ia and CN, and the rural and pervious parts of each sub-watershed. For the impervious parts, the losses are equal to the minimum values of Ia=0.04 and CN=98. The calibration process is done in the rural and pervious sub-sub watersheds through the use of quantiles from this regression and HEC-1 output.

6.5 CLARK'S SYNTHETIC UNIT HYDROGRAPH PARAMETERS (TC AND R)

The unit hydrograph parameters used in this study are calculated and presented in Appendix1. Rural, pervious and impervious parts of each sub-watershed were considered separately. Time of concentration was calculated using Kirby-Hathaway's formula:

$$Tc = 0.01377\ [(L*n)^{0.47} S^{-0.235}]$$

Where:

L = *distance of overland flow in feet (ft),*
n = *Manning's watershed roughness coefficient,*
S = *average slope in ft/ft.*

The Routing coefficients ***(R)*** were calculated based on an acceptable routing indicator: ***R/(Tc+R)***. This indicator directly impacts the peakedness of hydrographs. For rural and pervious sub-sub-watersheds, this indicator was found to fall between 0.5 and 0.8 based on the calibration process with regression quantiles. For the impervious sub-sub-watersheds, however, the indicator was assumed equal to 0.35. Appendix 1 shows the calculated parameters for all watersheds.
This process of calibration made the rainfall generated flood quantiles more reliable as design floods of known probabilities of occurrence.

6.6 URBAN HYDROLOGY

The urban hydrology procedure was developed to address the impact of urban growth on flood flows. In general, that procedure accounts for the effects on runoff due to two major urban changes: increased imperviousness and increased channelization. Increased imperviousness reduces the overland flow travel time and increases the volume of flow. Increased channelization, however, addresses the impact of conveyance through gutters and storm drains together with the increased storage abilities of these facilities. The effects of channelization are most pronounced in flat terrain with slopes less than 0.003. Imperviousness represents coverage from streets, buildings and other lot coverage. The coverage from streets in urban residential areas ranges from 20 to 25%, while for other land uses the total lot coverage ration could be as high as 95%. The concept of "Equivalent Street" is obtained from the land use requirements for ratio of streets as a part of the total urban sub-watershed. Based on that, the length and width of the Equivalent Streets in an urbanizing area are easily defined and hence, the unit hydrograph parameters are easily calculated (5, 8, 16). Appendix 1 shows the time of concentrations and the routing coefficients for all sub-watersheds.

6.7 ROUTING PROCEDURES

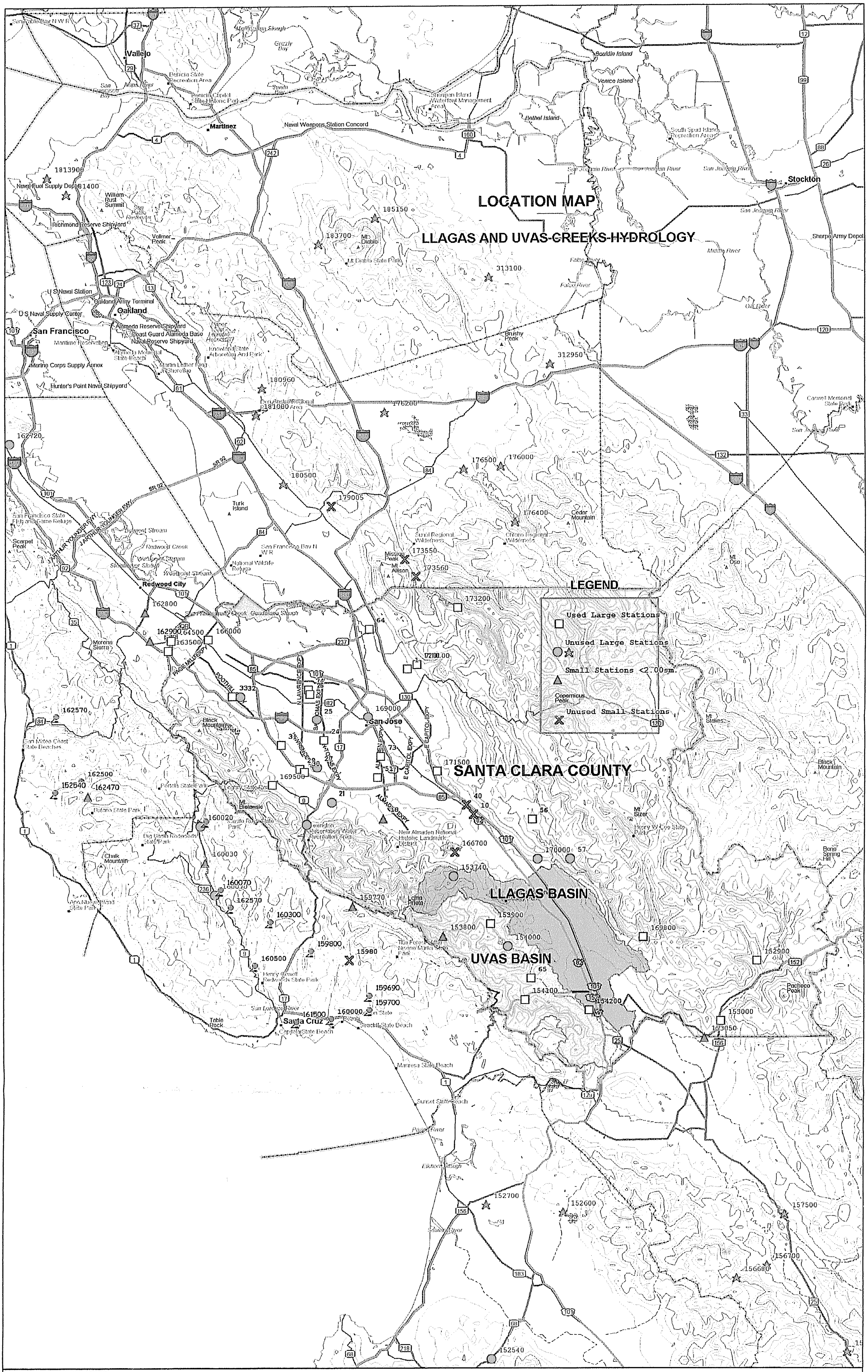
Several types of routing were used in this study. Storage routing was used to route urban floods through storm drains while Muskingum routing was used for small channels and Muskingum-Cunge routing was used for main channels. The storage routing through storm drains was done by using a unitized (for one square mile) storage-discharge relationship determined from the hydraulics of actual storm drains within this area (5, 8, 16). Appendix 1 shows the use of a unitized storage-discharge curve to develop relevant curves for each urban sub-area.

7 PHYSICAL HEC-1 MODELING OF WATERSHEDS

As stated earlier, the total watershed area of Uvas Creek is equal to 87 square miles. Because of the smaller time of concentration of urban sub-watersheds, it was decided that the HEC-1 time interval of the current study should be equal to 15 minutes. The previous 1978 HEC-1 models for Uvas Creek, was based on 30-minute time intervals. The current study is based on the 15 minutes time interval. Table 1 shows the 1978 design flows together with the current ones. Appendix-2 (computer Dics) shows the inputs/outputs of Uvas models..

8 MAPS SECTION

8.1 LOCATION MAP



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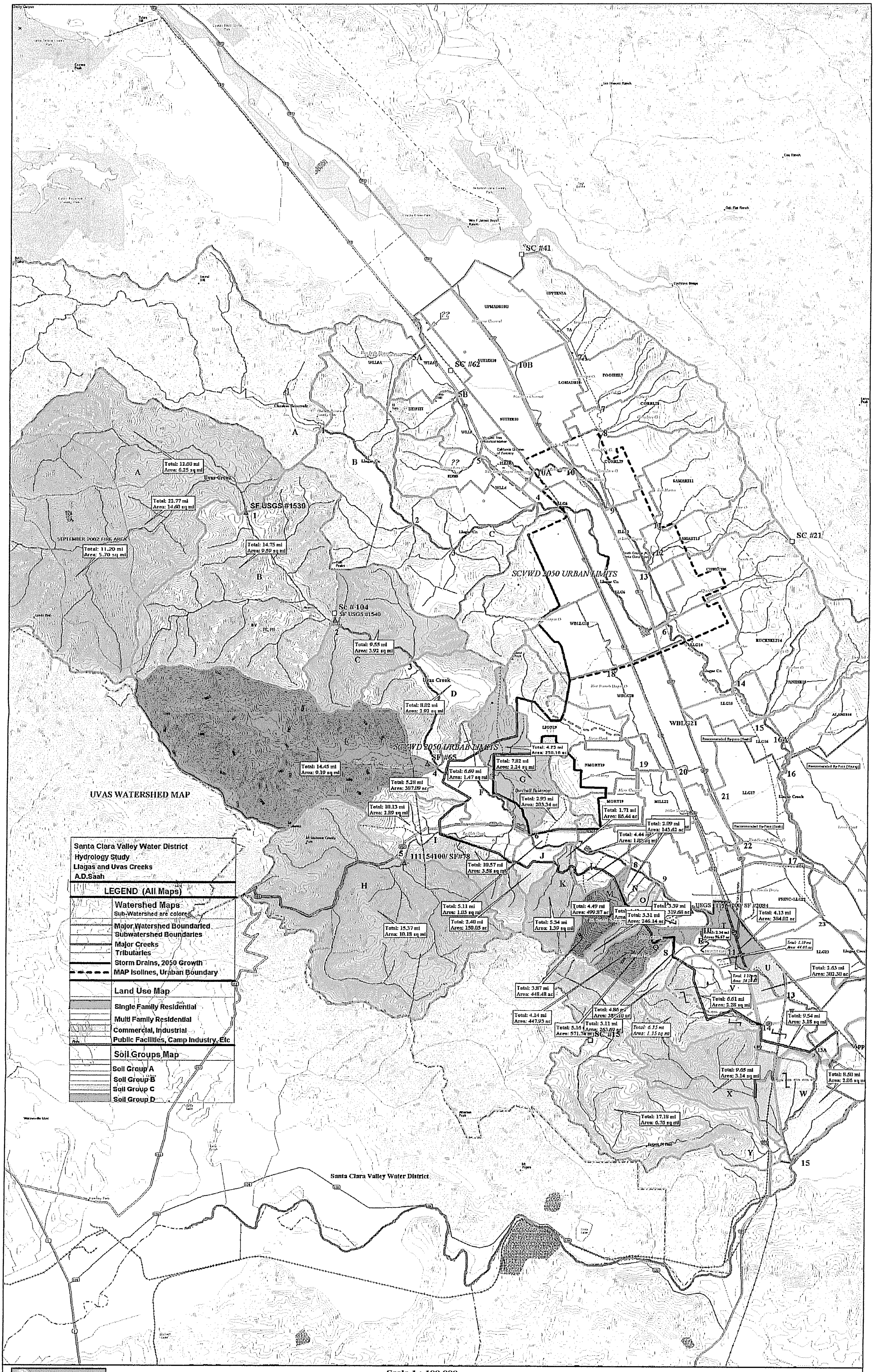
Zoom Level: 9-2 Datum: NAD27

8.2 MAP 2 - WATERSHED MAP



Scale 1 : 100,000
1" = 1.58 mi

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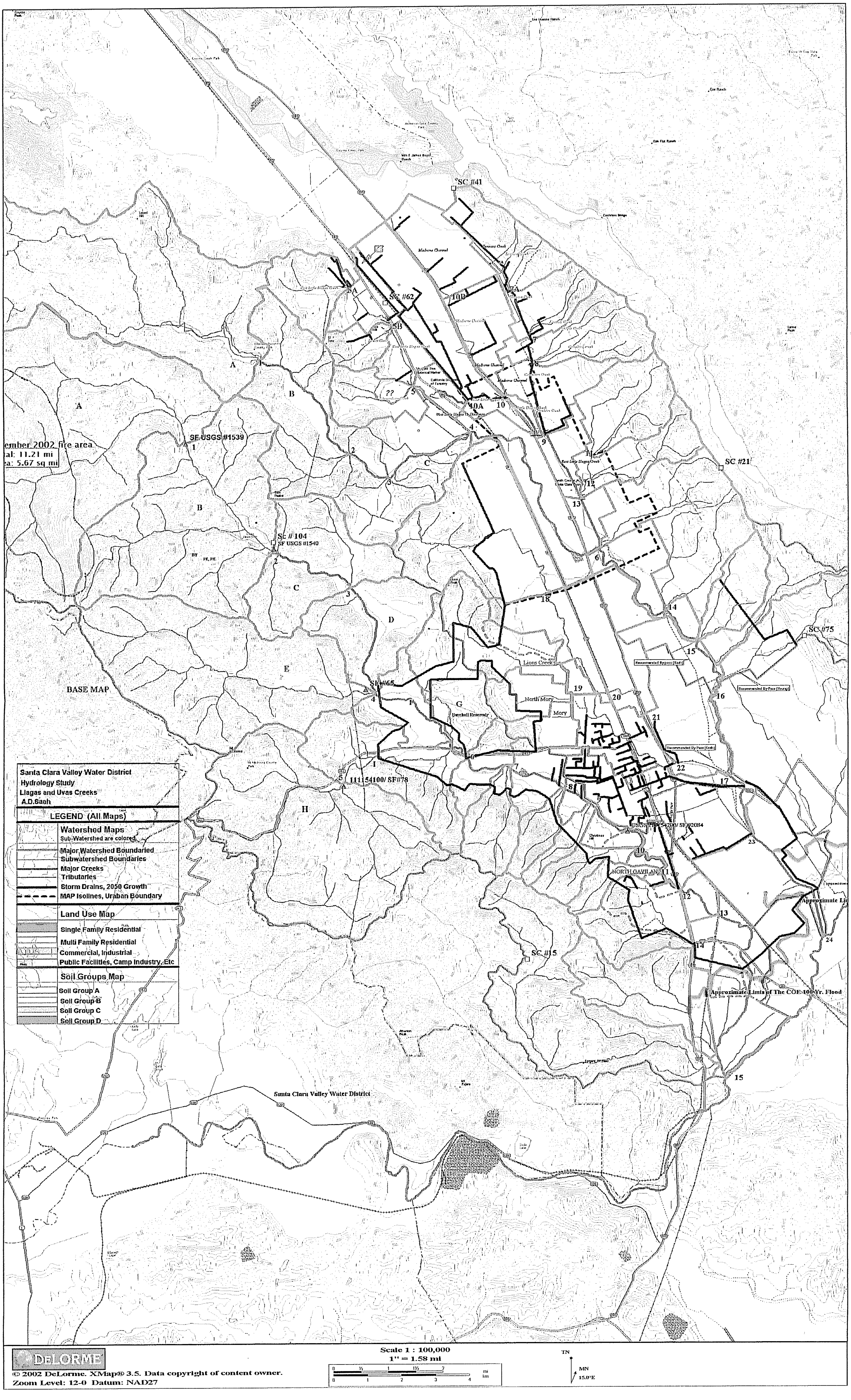
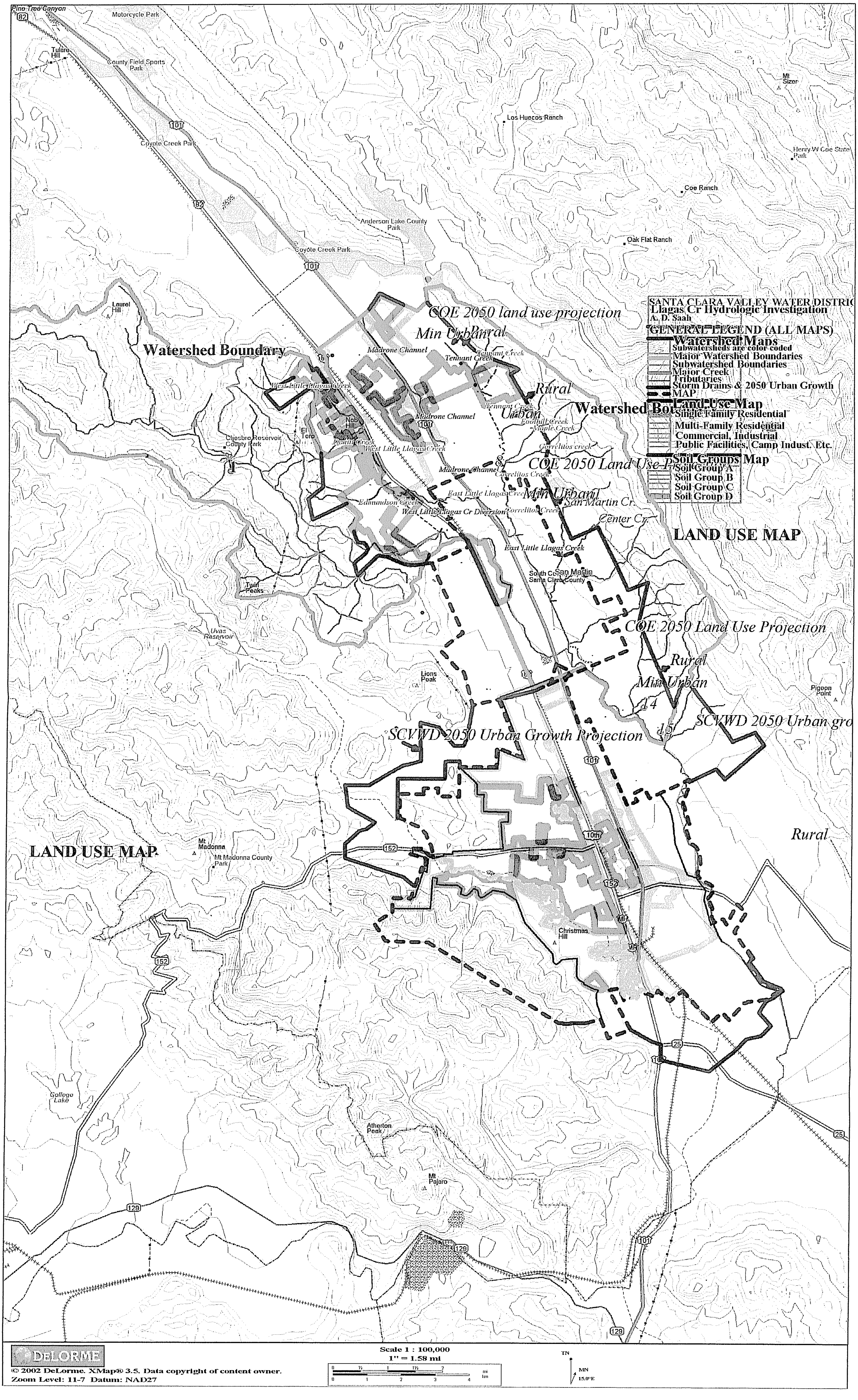
Zoom Level: 12-0 Datum: NAD27

8.3 MAP 3 - STORM DRAINS MAP


SC #41
SC #62
5A
5B
10B
10A
10
9
8
7
5
4
??
A
B
C
D
E
G
H
I
1
2
3
4
5
ember 2002 fire area
al: 11.21 mi
a: 5.67 sq mi
SF USGS #1539
SC # 104
SF USGS #1540
SC #21
SC #75
SC #65
SC #15
111 54100/ SF#78
USGS 1115 4200/ SF#2084
BASE MAP
Lions Creek
North Mory
Mory
Uvas Reservoir
NORTH GAVILAN
Recommended Bypass (Kash)
Recommended By Pass (Young)
Recommended By Pass (Kash)
Approximate Limits of The COE 100-Yr. Flood
Approximate Li
Santa Clara Valley Water District
6
11
12
13
14
15
16
17
18
19
20
21
22
23
24
Santa Clara Valley Water District
Hydrology Study
Llagas and Uvas Creeks
A.D.Saah
LEGEND (All Maps)
Watershed Maps
Sub-Watershed are colored
Major Watershed Boundaried
Subwatershed Boundaries
Major Creeks
Tributaries
Storm Drains, 2050 Growth
MAP Isolines, Uraban Boundary
Land Use Map
Single Family Residential
Multi Family Residential
Commercial, Industrial
Public Facilities, Camp Industry, Etc
Soil Groups Map
Soil Group A
Soil Group B
Soil Group C
Soil Group D
DELORME
© 2002 DeLorme. XMap® 3.5. Data copyright of content owner.
Zoom Level: 12-0 Datum: NAD27
Scale 1 : 100,000
1" = 1.58 mi
0
½
1
1½
2
mi
km
0
1
2
3
4
TN
MN
15.0°E

8.4 MAP 4 - LAND USE MAP


SANTA CLARA VALLEY WATER DISTRIC
Llagas Cr Hydrologic Investigation
A. D. Saah
GENERAL LEGEND (ALL MAPS)
Watershed Maps
Subwatersheds are color coded
Major Watershed Boundaries
Subwatershed Boundaries
Major Creek
Tributaries
Storm Drains & 2050 Urban Growth
MAP
Land Use Map
Single Family Residential
Multi-Family Residential
Commercial, Industrial
Public Facilities, Camp Indust. Etc.
Soil Groups Map
Soil Group A
Soil Group B
Soil Group C
Soil Group D
LAND USE MAP
LAND USE MAP
Watershed Boundary
COE 2050 land use projection
COE 2050 Land Use Projection
SCVWD 2050 Urban Growth Projection
SCVWD 2050 Urban gro
Rural
Min Urban
Urban
14
15
Pine Tree Canyon
Motorcycle Park
Tulare Hill
County Field Sports Park
Coyote Creek Park
Anderson Lake County Park
Los Huecos Ranch
Mt Sizer
Henry W Coe State Park
Coe Ranch
Oak Flat Ranch
Laurel Hill
Madrone Channel
Tennant Creek
West Little Llagas Creek
Nob Hill
El Toro
Chesbro Reservoir County Park
Foothill Creek
Maple Creek
Corralitos creek
San Martin Cr.
Center Cr.
Edmundson Creek
West Little Llagas Cr Diversion
East Little Llagas Creek
San Martin
South Central Santa Clara County
Twin Peaks
Uvas Reservoir
Lions Peak
Pigeon Point
Mt Madonna
Mt Madonna County Park
Christmas Hill
Gallego Lake
Atherton Peak
Mt Pajaro
82
101
152
10th
25
129
DELORME
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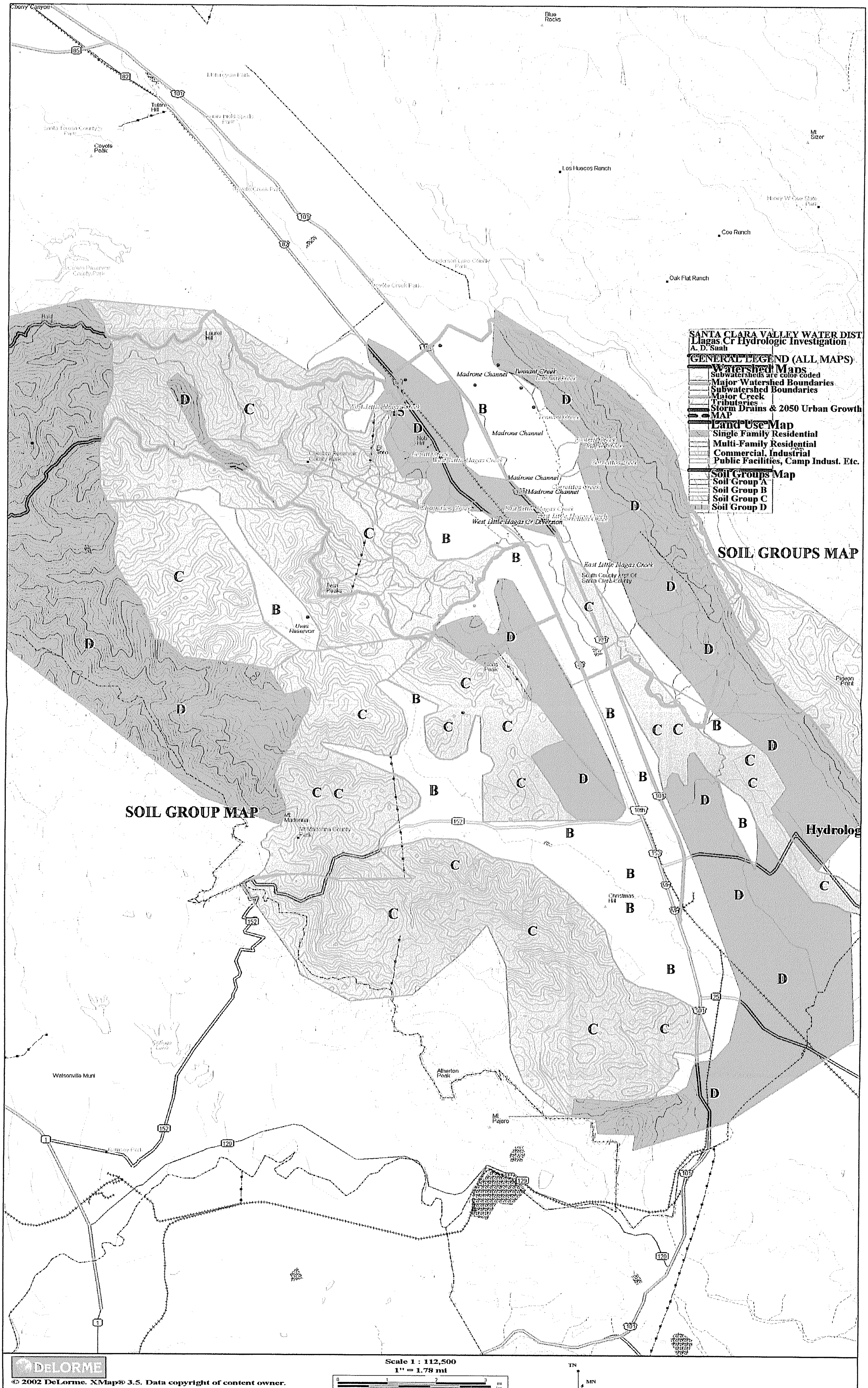
Zoom Level: 11-7 Datum: NAD27
Scale 1 : 100,000
1" = 1.58 mi
0 ½ 1 1½ 2 mi
0 1 2 3 4 km
TN
MN
15.0°E

8.5 MAP 5 - HYDROLOGIC SOIL TYPE MAP



DELORME

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Zoom Level: 11-7 Datum: NAD27

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10 APPENDICES

10.1 APPENDIX 1 - WATERSHED CHARACTERISTICS AND OTHER PARAMETERS FOR UVAS CREEK, (2050 RTIMP = 15 %)

UVAS CREEK HYDRLOGY
Areas
A.D. Saah

RTIMP=15%		Basin Totals				Rural Areas					Urban Areas				
BASIN	Tributary	Area	B	C	D	Percent	Area	B	C	D	Area	B	C	D	
		(sq. mi.)	(%)	(%)	(%)	Area	(sq. mi.)	(%)	(%)	(%)	(sq. mi.)	(%)	(%)	(%)	
Uvas Creek															
A	1	20.63	5	35	60	100	20.63	5	35	60					
B	2	9.59	10	80	10	100	9.59	10	80	10					
C	3	3.92		100		100	3.92		100						
D	4	2.92	25	75		100	2.92	25	75						
E	4	9.19	10	40	60	100	9.19	10	40	50					
F	6	1.47	80	20		41	0.60	50	50		0.87	100			rtimp
G	6	2.24	40	60		80	1.84	40	60		0.40	50	50		rtimp
H	5	10.18		100		100	10.18		100						
I	6	3.58	40	60		81	2.89	40	60		0.69	100			
J	7	1.03	40	60		53	0.55		100		0.48	100			rtimp
K	7	1.39	10	90		87	1.21	100			0.18	100			rtimp
L	8	1.03	5	95		22	0.23	90	10		0.80	100			rtimp
M	8	0.78	35	65		90	0.70	30	70		0.08	100			rtimp
N	9	0.28	100			0	0.00				0.28	100			
O	9	0.57	50	50		72	0.41	20	80		0.16	100			
P	10	0.50	100			0	0.00				0.50	100			
Q	10	0.89	35	65		79	0.70	20	80		0.19	100			
R+S	11	0.76	70	30		54	0.41	50	50		0.35	100			
T	12	0.75	100				0.00				0.75	100			
U	13	0.47	100			0	0.00				0.47	100			
V	14	2.20	60	40		59	1.30	30	70		0.90	100			
W	15	3.18	40		60	65	2.07	20		80	1.11	100			
X	15	3.14	10	80	10	100	3.14	10	80	10					
Y	15	6.76	5	85	10	100	6.76	5	85	10					

UVAS CREEK HYDROLOGY
Land Use
A.D. Sash

RTIMP=15%		Land Use and Overall % Imperviousness										
Uvas Creek												
		Total Area	Rural	Rural/Estate Residen	Low Density Resident	Medium Density Resident	High Density Resident	Commercial	Industrial	Public/Quasi-public	Park	% Overall Impervious
% Impervious			1	15	30	60	85	95	90	90	20	
A	1	20.63	100									
B	2	9.59	100									
C	3	3.92	100									
D	4	2.92	100									
E	4	9.19	100									
F	6	1.47	41	59								15
G	6	2.24	80	20								15
H	5	10.18	100									
I	6	3.58	81	19								15
J	7	1.03	53	0		27		20				75
K	7	1.39	87	0		12						60
L	8	1.03	22	0	30	33			5		10	50
M	8	0.78	90	0			10					85
N	9	0.28	0	0			20	20			60	50
O	9	0.57	72					20			8	75
P	10	0.50	0				40	40			20	80
Q	10	0.89	79	0	0			15			6	75
R+S	11	0.76	54	0		0	20	16	0	0	10	75
T	12	0.75			0	0	40	40			20	80
U	13	0.47	0	60			20	20				45
V	14	2.20	59	21		20						40
W	15	3.18	65	35								15
X	15	3.14	100									
Y	15	6.76	100									

UVAS CREEK HYDROLOGY
(CN) and (Ia) for Rural and Urban Areas
A.d. Saah

		Rural Areas								Urban Areas									
		Hydrologic Soil Types			AMC II					Hydrologic Soil Types			AMC II						
Basin	Tributary	B	C	D	B	C	D	Rural	Ia	B	C	D	B	C	D	Pervious	Ia	Imperv	Ia
		(%)	(%)	(%)	CN	CN	CN	CN	(in)	(%)	(%)	(%)	CN	CN	CN	CN	(in)	CN	(in)
Uvas Creek			Hydrologic Condition: FAIR																
A	1	5	35	60	3.65	28.7	51.6	84	0.38	0	0	0	0						
B	2	10	80	10	6.5	60.8	8.2	76	0.65	0	0	0	0	0	0				
C	3	0	100	0	0	76	0	76	0.63	0	0	0	0	0	0				
D	4	25	75	0	16.25	57	0	73	0.73	0	0	0	0	0	0				
E	4	10	40	50	6.5	30.4	41	78	0.57	0	0	0	0	0	0				
F	6	50	50	0	32.5	38	0	71	0.84	100	0	0	69	0	0	69	0.90	98	0.04
G	6	40	60	0	26	45.6	0	72	0.79	50	50	0	34.5	39.5	0	74	0.70	98	0.04
H	5	0	100	0	0	76	0	76	0.63	0	0	0	0	0	0				
I	6	40	60	0	26	45.6	0	72	0.79	100	0	0	69	0	0	69	0.90	98	0.04
J	7	0	100	0	0	76	0	76	0.63	100	0	0	69	0	0	69	0.90	98	0.04
K	7	100	0	0	65	0	0	65	1.08	100	0	0	69	0	0	69	0.90	98	0.04
L	8	90	10	0	58.5	7.6	0	66	1.03	100	0	0	69	0	0	69	0.90	98	0.04
M	8	30	70	0	19.5	53.2	0	73	0.75	100	0	0	69	0	0	69	0.90	98	0.04
N	9	0	0	0	0	0	0			100	0	0	69	0	0	69	0.90	98	0.04
O	9	20	80	0	13	60.8	0	74	0.71	100	0	0	69	0	0	69	0.90	98	0.04
P	10	0	0	0	0	0	0			100	0	0	69	0	0	69	0.90	98	0.04
Q	10	20	80	0	13	60.8	0	74	0.71	100	0	0	69	0	0	69	0.90	98	0.04
R+S	11	50	50	0	32.5	38	0	71	0.84	100	0	0	69	0	0	69	0.90	98	0.04
T	12	0	0	0	0	0	0			100	0	0	69	0	0	69	0.90	98	0.04
U	13	0	0	0	0	0	0			100	0	0	69	0	0	69	0.90	98	0.04
V	14	30	70	0	19.5	53.2	0	73	0.75	100	0	0	69	0	0	69	0.90	98	0.04
W	15	20	0	80	13	0	65.6	79	0.54	100	0	0	69	0	0	69	0.90	98	0.04
X	15	10	80	10	6.5	60.8	8.2	76	0.65	0	0	0	0	0	0				
Y	15	5	85	10	3.25	64.6	8.2	76	0.63	0	0	0	0	0	0				

Runoff Curve Numbers for Rural Areas

Hydrologic condition: Poor

Cover Type	B	C	D
Wood-grass	73	82	86
Woods	66	77	83

Hydrologic conditiion: Good

Cover Type	B	C	D
Wood-grass	58	72	79
Woods	55	70	77

Hydrologic condition: Fair

Cover Type	B	C	D
Wood-grass	65	76	82
Woods	60	73	79

Runoff Curve Numbers for Urban Areas

Hydrologic condition: Poor

Cover Typ	B	C	D
Open	79	86	89
Paved	98	98	98

Hydrologic condition: Good

Cover Ty	B	C	D
Open	61	74	80
Paved	98	98	98

Hydrologic condition: fair

Cover Typ	B	C	D
Open	69	79	84
Paved	98	98	98

Note: Change AMC for area A to 2 poor

UVAS CREEK HYDROLOGY

AMC Values

A. D. Saah

Basin	Tributary	AMC II				AMC 2.25				AMC 2.5				AMC 2.75				AMC III			
		Rural	Ia -Calc	Perv	Ia -Calc	Rural	Ia -Calc	Pervious	Ia -Calc	Rural	Ia -Calc	Pervious	Ia -Calc	Rural	Ia -Calc	Pervious	Ia -Calc	Rural	Ia -Calc	Pervious	Ia -Calc
		CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)
Uvas Creek			Hydrologic Condition: FAIR																		
A	1	79	0.53			83	0.42			86	0.32			90	0.23			93	0.14		
B	2	76	0.65			80	0.50			84	0.39			88	0.28			92	0.18		
C	3	76	0.63			80	0.50			84	0.39			88	0.28			92	0.18		
D	4	73	0.73			77	0.59			81	0.46			85	0.34			89	0.24		
E	4	78	0.57			82	0.45			85	0.34			89	0.24			93	0.16		
F	6	71	0.84	69	0.9	75	0.65	74	0.72	80	0.51	78	0.56	84	0.39	82	0.44	88	0.28	86	0.32
G	6	72	0.79	74	0.7	76	0.62	78	0.56	81	0.48	82	0.43	85	0.36	86	0.32	89	0.26	90	0.22
H	5	76	0.63			80	0.50			84	0.39			88	0.28			92	0.18		
I	6	72	0.79	69	0.9	76	0.62	74	0.72	81	0.48	78	0.56	85	0.36	82	0.44	89	0.26	86	0.32
J	7	76	0.63	69	0.9	80	0.50	74	0.72	84	0.39	78	0.56	88	0.28	82	0.44	92	0.18	86	0.32
K	7	65	1.08	69	0.9	70	0.88	74	0.72	74	0.70	78	0.56	79	0.55	82	0.44	83	0.41	86	0.32
L	8	66	1.03	69	0.9	71	0.84	74	0.72	75	0.67	78	0.56	79	0.52	82	0.44	84	0.39	86	0.32
M	8	73	0.75	69	0.9	77	0.59	74	0.72	81	0.46	78	0.56	85	0.34	82	0.44	89	0.24	86	0.32
N	9			69	0.9			74	0.72			78	0.56			82	0.44			86	0.32
O	9	74	0.71	69	0.9	78	0.56	74	0.72	82	0.43	78	0.56	86	0.32	82	0.44	90	0.22	86	0.32
P	10			69	0.9			74	0.72			78	0.56			82	0.44			86	0.32
Q	10	74	0.71	69	0.9	78	0.56	74	0.72	82	0.43	78	0.56	86	0.32	82	0.44	90	0.22	86	0.32
R+S	11	71	0.84	69	0.9	75	0.65	74	0.72	80	0.51	78	0.56	84	0.39	82	0.44	88	0.28	86	0.32
T	12			69	0.9			74	0.72			78	0.56			82	0.44			86	0.32
U	13			69	0.9			74	0.72			78	0.56			82	0.44			86	0.32
V	14	73	0.75	69	0.9	77	0.59	74	0.72	81	0.46	78	0.56	85	0.34	82	0.44	89	0.24	86	0.32
W	15	79	0.54	69	0.9	83	0.42	74	0.72	86	0.32	78	0.56	90	0.23	82	0.44	93	0.14	86	0.32
X	15	76	0.65			80	0.50			84	0.39			88	0.28			92	0.18		
Y	15	76	0.63			80	0.50			84	0.39			88	0.28			92	0.18		

Basin	Tributary	AMC I				AMC 1.25				AMC 1.5				AMC 1.75			
		Rural	Ia -Calc	Pervious	Ia -Calc	Rural	Ia -Calc	Pervious	Ia -Calc	Rural	Ia -Calc	Pervious	Ia -Calc	Rural	Ia -Calc	Pervious	Ia -Calc
		CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)	CN	(in)
Uvas Creek																	
A	1	62	1.24			66	1.03			70	0.86			66	1.03		
B	2	58	1.44			63	1.19			67	0.99			63	1.19		
C	3	58	1.44			63	1.19			67	0.99			63	1.19		
D	4	55	1.66			59	1.38			64	1.14			59	1.38		
E	4	61	1.30			65	1.09			69	0.90			65	1.09		
F	6	52	1.83	50	2.02	57	1.53	54	1.68	61	1.27	54	1.68	57	1.53	54	1.68
G	6	53	1.75	56	1.58	58	1.45	60	1.32	62	1.21	60	1.32	58	1.45	60	1.32
H	5	58	1.44			63	1.19			67	0.99			63	1.19		
I	6	53	1.75	50	2.02	58	1.45	54	1.68	62	1.21	54	1.68	58	1.45	54	1.68
J	7	58	1.44	50	2.02	63	1.19	54	1.68	67	0.99	54	1.68	63	1.19	54	1.68
K	7	45	2.44	50	2.02	50	2.00	54	1.68	55	1.64	54	1.68	50	2.00	54	1.68
L	8	46	2.33	50	2.02	51	1.91	54	1.68	56	1.57	54	1.68	51	1.91	54	1.68
M	8	55	1.66	50	2.02	59	1.38	54	1.68	64	1.14	54	1.68	59	1.38	54	1.68
N	9			50	2.02			54	1.68			54	1.68			54	1.68
O	9	56	1.58	50	2.02	60	1.32	54	1.68	65	1.09	54	1.68	60	1.32	54	1.68
P	10			50	2.02			54	1.68			54	1.68			54	1.68
Q	10	56	1.58	50	2.02	60	1.32	54	1.68	65	1.09	54	1.68	60	1.32	54	1.68
R+S	11	52	1.83	50	2.02	57	1.53	54	1.68	61	1.27	54	1.68	57	1.53	54	1.68
T	12			50	2.02			54	1.68			54	1.68			54	1.68
U	13			50	2.02			54	1.68			54	1.68			54	1.68
V	14	55	1.66	50	2.02	59	1.38	54	1.68	64	1.14	54	1.68	59	1.38	54	1.68
W	15	62	1.24	50	2.02	66	1.03	54	1.68	70	0.86	54	1.68	66	1.03	54	1.68
X	15	58	1.44			63	1.19			67	0.99			63	1.19		
Y	15	58	1.44			63	1.19			67	0.99			63	1.19		

1	2	3	4	5	6	7	8	9
AMC II	AMC I	AMC 1.5	AMC 2.5	AMC III	AMC 1.75	AMC 2.75	2.25	1.25
0.0	0	0	0	0	0.0	0.0	0.0	0
1.0	0.4	0.6	2.2	3.4	0.8	2.8	1.6	0.5
2.0	0.8	1.2	4.4	6.8	1.6	5.6	3.2	1
3.0	1.2	1.8	6.6	10.2	2.4	8.4	4.8	1.5
4.0	1.6	2.4	8.8	13.6	3.2	11.2	6.4	2
5.0	2	3	11	17	4.0	14.0	8.0	2.5
6.0	2.4	3.8	12.4	18.8	4.9	15.6	9.2	3.1
7.0	2.8	4.6	13.8	20.6	5.8	17.2	10.4	3.7
8.0	3.2	5.4	15.2	22.4	6.7	18.8	11.6	4.3
9.0	3.6	6.2	16.6	24.2	7.6	20.4	12.8	4.9
10.0	4	7	18	26	8.5	22.0	14.0	5.5
11.0	4.6	7.8	19.2	27.4	9.6	23.3	15.1	6.2
12.0	5.2	8.6	20.4	28.8	10.6	24.6	16.2	6.9
13.0	5.8	9.4	21.6	30.2	11.7	25.9	17.3	7.6
14.0	6.4	10.2	22.8	31.6	12.7	27.2	18.4	8.3
15.0	7	11	24	33	13.8	28.5	19.5	9
16.0	7.4	11.6	25.2	34.2	14.4	29.7	20.6	9.5
17.0	7.8	12.2	26.4	35.4	15.1	30.9	21.7	10
18.0	8.2	12.8	27.6	36.6	15.7	32.1	22.8	10.5
19.0	8.6	13.4	28.8	37.8	16.4	33.3	23.9	11
20.0	9	14	30	39	17.0	34.5	25.0	11.5
21.0	9.6	14.8	31	40.2	17.9	35.6	26.0	12.2
22.0	10.2	15.6	32	41.4	18.8	36.7	27.0	12.9
23.0	10.8	16.4	33	42.6	19.7	37.8	28.0	13.6
24.0	11.4	17.2	34	43.8	20.6	38.9	29.0	14.3
25.0	12	18	35	45	21.5	40.0	30.0	15
26.0	12.6	18.8	36	46	22.4	41.0	31.0	15.7
27.0	13.2	19.6	37	47	23.3	42.0	32.0	16.4
28.0	13.8	20.4	38	48	24.2	43.0	33.0	17.1
29.0	14.4	21.2	39	49	25.1	44.0	34.0	17.8
30.0	15	22	40	50	26.0	45.0	35.0	18.5
31.0	15.8	23	41	51	27.0	46.0	36.0	19.4
32.0	16.6	24	42	52	28.0	47.0	37.0	20.3
33.0	17.4	25	43	53	29.0	48.0	38.0	21.2
34.0	18.2	26	44	54	30.0	49.0	39.0	22.1
35.0	19	27	45	55	31.0	50.0	40.0	23
36.0	19.8	27.8	46	56	31.9	51.0	41.0	23.8
37.0	20.6	28.6	47	57	32.8	52.0	42.0	24.6
38.0	21.4	29.4	48	58	33.7	53.0	43.0	25.4
39.0	22.2	30.2	49	59	34.6	54.0	44.0	26.2
40.0	23	31	50	60	35.5	55.0	45.0	27
41.0	23.8	32	51	61	34.5	56.0	46.0	27.9
42.0	24.6	33	52	62	33.5	57.0	47.0	28.8
43.0	25.4	34	53	63	32.5	58.0	48.0	29.7
44.0	26.2	35	54	64	31.5	59.0	49.0	30.6
45.0	27	36	55	65	30.5	60.0	50.0	31.5
46.0	27.8	36.8	56	66	33.4	61.0	51.0	32.3
47.0	28.6	37.6	57	67	36.3	62.0	52.0	33.1
48.0	29.4	38.4	58	68	39.2	63.0	53.0	33.9
49.0	30.2	39.2	59	69	42.1	64.0	54.0	34.7
50.0	31	40	60	70	45.0	65.0	55.0	35.5
51.0	31.8	41	61	71	46.0	66.0	56.0	36.4

52.0	32.6	42	62	72	47.0	67.0	57.0	37.3
53.0	33.4	43	63	73	48.0	68.0	58.0	38.2
54.0	34.2	44	64	74	49.0	69.0	59.0	39.1
55.0	35	45	65	75	50.0	70.0	60.0	40
56.0	36	46	66	75.8	51.0	70.9	61.0	41
57.0	37	47	67	76.6	52.0	71.8	62.0	42
58.0	38	48	68	77.4	53.0	72.7	63.0	43
59.0	39	49	69	78.2	54.0	73.6	64.0	44
60.0	40	50	70	79	55.0	74.5	65.0	45
61.0	41	51	70.8	79.8	56.0	75.3	65.9	46
62.0	42	52	71.6	80.6	57.0	76.1	66.8	47
63.0	43	53	72.4	81.4	58.0	76.9	67.7	48
64.0	44	54	73.2	82.2	59.0	77.7	68.6	49
65.0	45	55	74	83	60.0	78.5	69.5	50
66.0	46.2	56	75	83.8	61.0	79.4	70.5	51.1
67.0	47.4	57	76	84.6	62.0	80.3	71.5	52.2
68.0	48.6	58	77	85.4	63.0	81.2	72.5	53.3
69.0	49.8	59	78	86.2	64.0	82.1	73.5	54.4
70.0	51	60	79	87	65.0	83.0	74.5	55.5
71.0	52.2	61.2	79.8	87.8	66.1	83.8	75.4	56.7
72.0	53.4	62.4	80.6	88.6	67.2	84.6	76.3	57.9
73.0	54.6	63.6	81.4	89.4	68.3	85.4	77.2	59.1
74.0	55.8	64.8	82.2	90.2	69.4	86.2	78.1	60.3
75.0	57	66	83	91	70.5	87.0	79.0	61.5
76.0	58.2	67	83.8	91.6	71.5	87.7	79.9	62.6
77.0	59.4	68	84.6	92.2	72.5	88.4	80.8	63.7
78.0	60.6	69	85.4	92.8	73.5	89.1	81.7	64.8
79.0	61.8	70	86.2	93.4	74.5	89.8	82.6	65.9
80.0	63	71	87	94	75.5	90.5	83.5	67
81.0	64.4	72.2	87.8	94.6	76.6	91.2	84.4	68.3
82.0	65.8	73.4	88.6	95.2	77.7	91.9	85.3	69.6
83.0	67.2	74.6	89.4	95.8	78.8	92.6	86.2	70.9
84.0	68.6	75.8	90.2	96.4	79.9	93.3	87.1	72.2
85.0	70	77	91	97	81.0	94.0	88.0	73.5
86.0	71.6	78.4	91.6	97.2	82.2	94.4	88.8	75
87.0	73.2	79.8	92.2	97.4	83.4	94.8	89.6	76.5
88.0	74.8	81.2	92.8	97.6	84.6	95.2	90.4	78
89.0	76.4	82.6	93.4	97.8	85.8	95.6	91.2	79.5
90.0	78	84	94	98	87.0	96.0	92.0	81
91.0	79.8	85.4	94.6	98.2	88.2	96.4	92.8	82.6
92.0	81.6	86.8	95.2	98.4	89.4	96.8	93.6	84.2
93.0	83.4	88.2	95.8	98.6	90.6	97.2	94.4	85.8
94.0	85.2	89.6	96.4	98.8	91.8	97.6	95.2	87.4
95.0	87	91	97	99	93.0	98.0	96.0	89
96.0	89.6	92.8	97.6	99.2	94.4	98.4	96.8	91.2
97.0	92.2	94.6	98.2	99.4	95.8	98.8	97.6	93.4
98.0	94.8	96.4	98.8	99.6	97.2	99.2	98.4	95.6
99.0	97.4	98.2	99.4	99.8	98.6	99.6	99.2	97.8
100.0	100	100	100	100	100.0	100.0	100.0	100

UVAS CREEK
Summary of CN, Ia, Tc's, R's Channel Routing
A. D. Saah

RTIMP=15%				Urban Area			Rural Area		Urban Perv. Area		Urban Imp. Area		Rural Area		Urban Perv. Area		Urban Imp. Area		Muskinggum-Cunge routing							
Sub-		Total area	Rural Area	Urban	Imper Area	Perv Area	LS (1)	LS(2)	LS (1)	LS(2)	LS (1)	LS(2)	UC(1)	UC(2)	UC(1)	UC(2)	UC(1)	UC(2)	RD(1)	RD(2)	RD(3)	RD(5)	RD(6)	RD(7)	Node	Notes
Basin	Tributary	(sq. mi)	(sq. mi)	(sq. mi)	(sq. mi)	Sq. Mi.	STRTL	CRVNBR	STRTL	CRVNBR	STRTL	CRVNBR	Tc	R	Tc	R	Tc	R	L	S	n	Shape	WD	Z		
A	1	20.63	20.63	0.00			0.53	79	0.00	0	0.00	0	1.08	1.62			0.25	0.13								
B	2	9.59	9.59	0.00			0.65	76					0.71	1.06			0.25	0.13	2.61	0.005	0.005	Trap	5	1		1--2
C	3	3.92	3.92	0.00			0.63	76					0.62	0.94			0.25	0.13	1.76	0.007						2--3
D	4	2.92	2.92	0.00			0.73	73					0.61	0.91			0.25	0.13	2.2	0.005						3--4
E	4	9.19	9.19	0.00			0.57	78					1.01	1.52			0.25	0.13								
F	6	1.47	0.60	0.87	0.13	0.74	0.84	71	0.90	69	0.04	98	0.22	0.32	1.10	1.64	0.25	0.13								
G	6	2.24	1.84	0.40	0.06	0.34	0.79	72	0.70	74	0.04	98	1.11	1.67	1.03	1.54	0.25	0.16	2.04	0.003						4--6
H	5	10.18	10.18	0.00			0.63	76					0.87	1.30			0.30	0.13								
I	6	3.58	2.89	0.69	0.10	0.59	0.79	72	0.90	69	0.04	98	0.45	0.67	1.03	1.54	0.25	0.13	3.07	0.012						5--6
J	7	1.03	0.55	0.48	0.36	0.12	0.63	76	0.90	69	0.04	98	0.30	0.44	0.54	0.81	0.25	0.13	1	0.003						6--7
K	7	1.39	1.21	0.18	0.11	0.07	1.08	65	0.90	69	0.04	98	0.12	0.17	0.36	0.53	0.25	0.13								
L	8	1.03	0.23	0.80	0.40	0.40	1.03	66	0.90	69	0.04	98	0.23	0.35	0.50	0.75	0.25	0.08	1.12	0.004						7--8
M	8	0.78	0.70	0.08	0.07	0.01	0.75	73	0.90	69	0.04	98	0.32	0.49	0.28	0.41	0.15	0.13								
N	9	0.28	0.00	0.28	0.14	0.14			0.90	69	0.04	98			0.34	0.51	0.25	0.13	0.69	0.001						8--9
O	9	0.57	0.41	0.16	0.12	0.04	0.71	74	0.90	69	0.04	98	0.29	0.43	0.25	0.37	0.25	0.13								
P	10	0.50	0.00	0.50	0.40	0.10			0.90	69	0.04	98			0.27	0.40	0.25	0.13	1.37	0.0004						9--10
Q	10	0.89	0.70	0.19	0.14	0.05	0.71	74	0.90	69	0.04	98	0.26	0.39	0.31	0.46	0.25	0.13								
R+S	11	0.76	0.41	0.35	0.26	0.09	0.84	71	0.90	69	0.04	98	0.25	0.37	0.34	0.51	0.25	0.13	1.07	0.004						10--11
T	12	0.75	0.00	0.75	0.60	0.15			0.90	69	0.04	98			0.56	0.84	0.25	0.13	0.57	0.0002						11--12
U	13	0.47	0.00	0.47	0.21	0.26			0.90	69	0.04	98			0.52	0.78	0.25	0.13	0.99	0.003						12--13
V	14	2.20	1.30	0.90	0.36	0.54	0.75	73	0.90	69	0.04	98	0.53	0.79	0.63	0.95	0.25	0.13	1.55	0.0024						13-13A
W	15	3.18	2.07	1.11	0.17	0.94	0.54	79	0.90	69	0.04	98	1.05	1.57	1.13	1.70	0.25	0.13	2.49	0.001						13A-15
X	15	3.14	3.14	0.00			0.65	76					0.70	1.05			0.25	0.13								
Y	15	6.76	6.76	0.00			0.63	76					1.22	1.83			0.25	0.00	3.89	0.002						14-15
	TOTALS	87.45	79.24	8.21	3.63	4.58																				

UVAS CREEK HYDROLOGY

Calcs. of Urban Tc's
By: A.D Bash

RTIMP=15%				RURAL AREAS				URBAN				IMPERVIOUS AREAS														PERVIOUS AREAS							
							Rural			Impervious								Street		Overland		Overland		Street		Pervious	Overland			Pervious		Final TC's	
Basin	Tributary	Total area	Rural Area	Lm	n	S	TCr	Urban Area	%Imp	Area		% Ast	Ast	Wst	Lst	Ll	Lcb	n	S	n	S	TCl		TC(c,b)		Area	Lp	n	S	TCp		Imp Tc	Perv TC.
		(sq. mi)	(sq. mi)	(ft)		(ft/ft)	(hr)	(sq. mi)		(sq. mi)	%		(sq. ft)	(ft)	(ft)	(ft)	(ft)		(ft/ft)		(ft/ft)	(hr)	hr	(hr)	hr	(sq. mi)	(ft)		(ft/ft)	(hr)		Hr	Hr
A	1	20.03	20.03	48675.20	0.04	0.030	1.08							50			300	0.02		0.03													
B	2	9.59	9.59	24710.40	0.04	0.052	0.71							50			300	0.02		0.03													
C	3	3.92	3.92	17793.60	0.04	0.045	0.82							50			300	0.02		0.03													
D	4	2.92	2.92	5280.00	0.04	0.005	0.81							50			300	0.02		0.03													
E	4	9.19	9.19	34531.20	0.04	0.022	1.01							50			300	0.02		0.03													
F	6	1.47	0.60	3273.60	0.04	0.142	0.22	0.87	15	0.13	15	2.25	645719.68	50	10014	142	300	0.02	0.0045	0.03	0.0045	0.10	0.10	0.11	0.17	0.74	944	0.5	0.0045	0.89	0.89	0.21	1.10
G	6	2.24	1.84	21859.20	0.04	0.006	1.11	0.40	15	0.06	15	2.25	250905.6	50	5018	142	300	0.02	0.0059	0.03	0.0059	0.09	0.09	0.11	0.17	0.34	944	0.5	0.0059	0.83	0.83	0.20	1.03
H	5	10.18	10.18	30043.20	0.04	0.032	0.87							50			300	0.02		0.03													
I	6	3.58	2.89	9134.40	0.04	0.040	0.45	0.69	15	0.10	15	2.25	433401.788	50	8668	142	300	0.02	0.0059	0.03	0.0059	0.09	0.09	0.11	0.17	0.59	943	0.5	0.0059	0.83	0.83	0.20	1.03
J	7	1.03	0.55	3854.40	0.04	0.051	0.30	0.48	75	0.36	15	11.25	1518292.51	50	30366	142	300	0.02	0.0019	0.03	0.0019	0.12	0.12	0.14	0.17	0.12	54	0.5	0.0019	0.28	0.28	0.28	0.64
K	7	1.39	1.21	8870.40	0.04	0.148	0.34	0.18	60	0.11	15	9	453380.419	50	9068	142	300	0.02	0.025	0.03	0.025	0.06	0.06	0.09	0.17	0.07	110	0.5	0.0250	0.22	0.22	0.14	0.36
L	8	1.03	0.23	3009.60	0.04	0.084	0.23	0.80	50	0.40	20	10	2239750.66	50	44795	100	300	0.02	0.0061	0.03	0.0061	0.08	0.08	0.11	0.17	0.40	124	0.5	0.0061	0.32	0.32	0.18	0.50
M	8	0.78	0.70	8553.60	0.04	0.170	0.32	0.08	85	0.07	15	12.75	277250.088	50	5545	142	300	0.02	0.0214	0.03	0.0214	0.07	0.07	0.09	0.17	0.01	34	0.5	0.0214	0.13	0.13	0.16	0.29
N	9	0.28						0.28	50	0.14	20	10	780595.2	50	15612	100	300	0.02	0.0313	0.03	0.0313	0.05	0.05	0.07	0.17	0.14	125	0.5	0.0313	0.22	0.22	0.12	0.34
O	9	0.57	0.41	6969.60	0.04	0.185	0.29	0.16	75	0.12	20	15	667408.896	50	13348	100	300	0.02	0.0357	0.03	0.0357	0.05	0.05	0.07	0.17	0.04	42	0.5	0.0357	0.13	0.13	0.12	0.25
P	10	0.50						0.50	80	0.40	20	16	2230272	50	44605	100	300	0.02	0.0189	0.03	0.0189	0.06	0.06	0.08	0.17	0.10	31	0.5	0.0189	0.13	0.13	0.14	0.27
Q	10	0.89	0.70	5491.20	0.04	0.173	0.26	0.19	75	0.14	15	11.25	560178.208	50	11724	142	300	0.02	0.0225	0.03	0.0225	0.07	0.07	0.08	0.17	0.05	69	0.5	0.0226	0.17	0.17	0.14	0.31
R+S	11	0.78	0.41	5280.00	0.04	0.109	0.26	0.35	75	0.26	15	11.25	1008457.47	50	21920	142	300	0.02	0.014	0.03	0.014	0.07	0.07	0.09	0.17	0.09	56	0.5	0.0140	0.18	0.18	0.16	0.34
T	12	0.75						0.75	80	0.60	20	16	3345408	50	66908	100	300	0.02	0.0008	0.03	0.0008	0.12	0.12	0.17	0.17	0.15	31	0.5	0.0008	0.27	0.27	0.29	0.56
U	13	0.47						0.47	45	0.21	20	9	1179250.32	50	23585	100	300	0.02	0.0007	0.03	0.0007	0.07	0.07	0.10	0.17	0.26	153	0.5	0.0007	0.34	0.34	0.18	0.52
V	14	2.20	1.30	12619.20	0.04	0.047	0.53	0.90	40	0.36	20	8	2011706.34	50	40234	100	300	0.02	0.0038	0.03	0.0038	0.09	0.09	0.12	0.17	0.54	167	0.5	0.0038	0.43	0.43	0.20	0.63
W	15	3.18	2.07	12830.40	0.04	0.003	1.05	1.11	15	0.17	15	2.25	698144.832	50	13963	142	300	0.02	0.0039	0.03	0.0039	0.10	0.10	0.12	0.17	0.94	941	0.5	0.0039	0.91	0.91	0.22	1.13
X	15	3.14	3.14	19483.20	0.04	0.033	0.70							50			300	0.02		0.03													
Y	15	6.76	6.76	44352.00	0.04	0.018	1.22							50			300	0.02		0.03													
	Llg14&15							If % Imp=			Then %ast =()*%Imp									correctionof overland slopes have no impact on min Tcl's and Rl's., see summary sheets.													
	are adjusted								15-30%			15%																					
									>30%			20%										Areas Llg14&15 are adjusted to include areas west of Llg											

Basin	Tributary	Rural TCr (hr)	Impervious TC(imp) (hr)	Pervious TC(perv) (hr)	Impervious R/(Tc+R)	Pervious R/(Tc+R)	Rural R (hr)	Impervious R (hr)	Pervious R (hr)
A	1	1.08	0.25		0.35	0.5	1.1	0.13	
B	2	0.71	0.25		0.35	0.5	0.7	0.13	
C	3	0.62	0.25		0.35	0.5	0.6	0.13	
D	4	0.61	0.25		0.35	0.5	0.6	0.13	
E	4	1.01	0.25		0.35	0.5	1.0	0.13	
F	6	0.22	0.25	1.10	0.35	0.5	0.2	0.13	1.10
G	6	1.11	0.25	1.03	0.35	0.5	1.1	0.13	1.03
H	5	0.87	0.30		0.35	0.5	0.9	0.16	
I	6	0.45	0.25	1.03	0.35	0.5	0.4	0.13	1.03
J	7	0.30	0.25	0.54	0.35	0.5	0.3	0.13	0.54
K	7	0.34	0.25	0.36	0.35	0.5	0.3	0.13	0.36
L	8	0.23	0.25	0.50	0.35	0.5	0.2	0.13	0.50
M	8	0.32	0.15	0.28	0.35	0.5	0.3	0.08	0.28
N	9		0.25	0.34	0.35	0.5		0.13	0.34
O	9	0.29	0.25	0.25	0.35	0.5	0.3	0.13	0.25
P	10		0.25	0.27	0.35	0.5		0.13	0.27
Q	10	0.26	0.25	0.31	0.35	0.5	0.3	0.13	0.31
R+S	11	0.25	0.25	0.34	0.35	0.5	0.2	0.13	0.34
T	12		0.25	0.56	0.35	0.5		0.13	0.56
U	13		0.25	0.52	0.35	0.5		0.13	0.52
V	14	0.53	0.25	0.63	0.35	0.5	0.5	0.13	0.63
W	15	1.05	0.25	1.13	0.35	0.5	1.0	0.13	1.13
X	15	0.70	0.25		0.35	0.5	0.7	0.13	
Y	15	1.22	0.25		0.35	0.5	1.2	0.13	

Note: Tc was made equal or more than NMIN, R was made equal or more than 1/2 NMIN lopes have no impact on Tci and Ri's.. RTIMP=15%

UVAS CREEK HYDROLOGY

Overland Flow R's

R+S Basin	Tributary	Rural TCr (hr)	Impervious TC(imp) (hr)	Pervious TC(perv) (hr)	Impervious R/(Tc+R)	Pervious R/(Tc+R)	Rural R (hr)	Impervious R (hr)	Pervious R (hr)
A	1	1.08	0.25		0.35	0.6	1.6	0.13	
B	2	0.71	0.25		0.35	0.6	1.1	0.13	
C	3	0.62	0.25		0.35	0.6	0.9	0.13	
D	4	0.61	0.25		0.35	0.6	0.9	0.13	
E	4	1.01	0.25		0.35	0.6	1.5	0.13	
F	6	0.22	0.25	1.10	0.35	0.6	0.3	0.13	1.64
G	6	1.11	0.25	1.03	0.35	0.6	1.7	0.13	1.54
H	5	0.87	0.30		0.35	0.6	1.3	0.16	
I	6	0.45	0.25	1.03	0.35	0.6	0.7	0.13	1.54
J	7	0.30	0.25	0.54	0.35	0.6	0.4	0.13	0.81
K	7	0.34	0.25	0.36	0.35	0.6	0.5	0.13	0.53
L	8	0.23	0.25	0.50	0.35	0.6	0.4	0.13	0.75
M	8	0.32	0.15	0.28	0.35	0.6	0.5	0.08	0.41
N	9		0.25	0.34	0.35	0.6		0.13	0.51
O	9	0.29	0.25	0.25	0.35	0.6	0.4	0.13	0.37
P	10		0.25	0.27	0.35	0.6		0.13	0.40
Q	10	0.26	0.25	0.31	0.35	0.6	0.4	0.13	0.46
R+S	11	0.25	0.25	0.34	0.35	0.6	0.4	0.13	0.51
T	12		0.25	0.56	0.35	0.6		0.13	0.84
U	13		0.25	0.52	0.35	0.6		0.13	0.78
V	14	0.53	0.25	0.63	0.35	0.6	0.8	0.13	0.95
W	15	1.05	0.25	1.13	0.35	0.6	1.6	0.13	1.70
X	15	0.70	0.25		0.35	0.6	1.1	0.13	
Y	15	1.22	0.25		0.35	0.6	1.8	0.13	

Note: Tc was made equal or more than NMIN, R was made equal or more than 1/2 NMIN

lopes have no impact on Tci and Ri's.. RTIMP=15%

Basin	Tributary	Rural TCr (hr)	Impervious TC(imp) (hr)	Pervious TC(perv) (hr)	Impervious R/(Tc+R)	Pervious R/(Tc+R)	Rural R (hr)	Impervious R (hr)	Pervious R (hr)
A	1	1.08	0.25		0.35	0.7	2.5	0.13	
B	2	0.71	0.25		0.35	0.7	1.6	0.13	
C	3	0.62	0.25		0.35	0.7	1.5	0.13	
D	4	0.61	0.25		0.35	0.7	1.4	0.13	
E	4	1.01	0.25		0.35	0.7	2.4	0.13	
F	6	0.22	0.25	1.10	0.35	0.7	0.5	0.13	2.56
G	6	1.11	0.25	1.03	0.35	0.7	2.6	0.13	2.40
H	5	0.87	0.30		0.35	0.7	2.0	0.16	
I	6	0.45	0.25	1.03	0.35	0.7	1.0	0.13	2.40
J	7	0.30	0.25	0.54	0.35	0.7	0.7	0.13	1.26
K	7	0.34	0.25	0.36	0.35	0.7	0.8	0.13	0.83
L	8	0.23	0.25	0.50	0.35	0.7	0.5	0.13	1.17
M	8	0.32	0.15	0.28	0.35	0.7	0.8	0.08	0.64
N	9		0.25	0.34	0.35	0.7		0.13	0.80
O	9	0.29	0.25	0.25	0.35	0.7	0.7	0.13	0.58
P	10		0.25	0.27	0.35	0.7		0.13	0.62
Q	10	0.26	0.25	0.31	0.35	0.7	0.6	0.13	0.72
R+S	11	0.25	0.25	0.34	0.35	0.7	0.6	0.13	0.80
T	12		0.25	0.56	0.35	0.7		0.13	1.31
U	13		0.25	0.52	0.35	0.7		0.13	1.22
V	14	0.53	0.25	0.63	0.35	0.7	1.2	0.13	1.48
W	15	1.05	0.25	1.13	0.35	0.7	2.4	0.13	2.64
X	15	0.70	0.25		0.35	0.7	1.6	0.13	
Y	15	1.22	0.25		0.35	0.7	2.9	0.13	

Note: Tc was made equal or more than NMIN, R was made equal or more than 1/2 NMIN
opes have no impact on Tci and Ri's.. RTIMP=15%

Basin	Tributary	Rural TCr (hr)	Impervious TC(imp) (hr)	Pervious TC(perv) (hr)	Impervious R/(Tc+R)	Pervious R/(Tc+R)	Rural R (hr)	Impervious R (hr)	Pervious R (hr)
A	1	1.08	0.25		0.35	0.8	4.3	0.13	
B	2	0.71	0.25		0.35	0.8	2.8	0.13	
C	3	0.62	0.25		0.35	0.8	2.5	0.13	
D	4	0.61	0.25		0.35	0.8	2.4	0.13	
E	4	1.01	0.25		0.35	0.8	4.0	0.13	
F	6	0.22	0.25	1.10	0.35	0.8	0.9	0.13	4.39
G	6	1.11	0.25	1.03	0.35	0.8	4.4	0.13	4.11
H	5	0.87	0.30		0.35	0.8	3.5	0.16	
I	6	0.45	0.25	1.03	0.35	0.8	1.8	0.13	4.11
J	7	0.30	0.25	0.54	0.35	0.8	1.2	0.13	2.16
K	7	0.34	0.25	0.36	0.35	0.8	1.4	0.13	1.42
L	8	0.23	0.25	0.50	0.35	0.8	0.9	0.13	2.00
M	8	0.32	0.15	0.28	0.35	0.8	1.3	0.08	1.10
N	9		0.25	0.34	0.35	0.8		0.13	1.37
O	9	0.29	0.25	0.25	0.35	0.8	1.2	0.13	0.99
P	10		0.25	0.27	0.35	0.8		0.13	1.07
Q	10	0.26	0.25	0.31	0.35	0.8	1.0	0.13	1.24
R+S	11	0.25	0.25	0.34	0.35	0.8	1.0	0.13	1.36
T	12		0.25	0.56	0.35	0.8		0.13	2.25
U	13		0.25	0.52	0.35	0.8		0.13	2.08
V	14	0.53	0.25	0.63	0.35	0.8	2.1	0.13	2.54
W	15	1.05	0.25	1.13	0.35	0.8	4.2	0.13	4.53
X	15	0.70	0.25		0.35	0.8	2.8	0.13	
Y	15	1.22	0.25		0.35	0.8	4.9	0.13	

Note: Tc was made equal or more than NMIN, R was made equal or more than 1/2 NMIN
opes have no impact on Tci and Ri's.. RTIMP=15%

3/20/2003

SCVWD Uvas Creek Hydrol

####### RTIMP=15%

UVAS Creek Project
Summary of QUANTILES

9/12

s=Saah, m=Multiplicativ, L=Linear,
TDS=Time Duration Specific Precip.

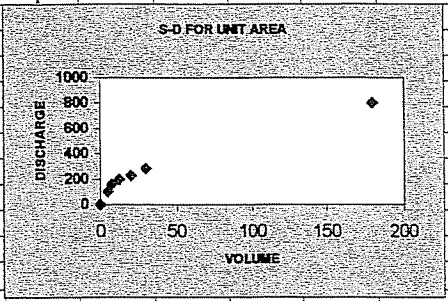
							9S-LQxx					9V1Dp						Floods (cfs)						24-Hr Volume (cfs)				1-DAY Volumes (cfs)						Precip (in) (TDS)				Recorded Values			
Basin	C. Pt.	Area	MAP	Lm	Sm	LLS	200	100	10	2	100	200	100	100	10	10	2																								
		(sq. mi)	(in)	(mi)	(ft/ft)	(mi.mi)	Peak	Peak	Peak	Peak	F	24HR	24HR	V	24HR	V	24HR	200Yr	100Yr	100	100	10Yr	2Yr	200Yr	100Yr	10Yr	2Yr	200Yr	100Yr	100	100	10Yr	2Yr	200Yr	100Yr	10Yr	2Yr	200	100	10	2
Au	0	0		0.00																																					
Ar	1	20.63	42.0	8.84	0.0300	180.67	10614	9462	4762	1433	10.9	4734	4052	388994	1813	174068	609	7523	6626	5913sb	7100m	3534	1289	3977	3493	1837	654	3458	3037	2988sb	3566L	1597	369	12.08	11.04	7.39	4.36				
USGS	15390						8260	7810	5530	2690																															
A	1	20.63	42.0	8.84	0.0300	180.67	10614	9462	4762	1433	10.9	4734	4052	388994	1813	174068	609							0	0	0	0														
Bu	0	0																						0	0	0	0														
Br	2	9.59	36.0	4.68	0.0516	28.02	4404	3887	1865	534	11.3	1879	1613	154801	732	70315	249	3527	3116	28381	3856m	1687	630	1518	1337	713	260	1320	1163	1187SB	1385L	620	226	10.49	9.58	6.42	3.78	#104 Uvas Res.			
B	2	9.59	36.0	4.68	0.0516	28.02	4404	3887	1865	534	11.3	1879	1613	154801	732	70315	249							0	0	0	0											MAP=27.75			
Cu	0	0		0.00																				0	0	0	0											7.99	7.44	5.4	3.36
Cr	3	3.92	29.0	3.37	0.0452	14.11	1520	1325	598	160	11.7	612	527	50555	243	23320	83	1647	1443	990L	1569M	751	263	553	483	246	84	481	420	416SB	448L	214	73	8.62	7.78	5.28	3.11				
C	3	3.92	29.0	3.37	0.0542	12.88	1520	1325	598	160	11.7	612	527	50555	243	23320	83							0	0	0	0														
Du	0	0		0.00																				0	0	0	0														
Dr	4	2.92	27.5	2.19	0.0045	44.73	1091	947	420	110	11.8	432	372	35734	173	16584	60	1487	1288	1424SB	892L	634	203	465	401	193	60	404	349	348L	421SB	168	52	8.22	7.51	5.04	2.96	#62 Morgan Hill			
D	4	2.92	27.5	2.19	0.0045	44.73	1091	947	420	110	11.8	432	372	35734	173	16584	60							0	0	0	0											MAP=20.8			
Eu	0	0		0.00																				0	0	0	0											7.73	7.08	4.77	2.71
Er	4	9.19	34.0	6.54	0.0220	138.89	3994	3519	1672	471	11.3	1685	1446	138826	656	62936	221	3904	3402	2280SB	3144M	1720	576	1643	1427	708	230	1429	1241	1148SB	1266L	616	200	9.95	9.1	6.1	3.59				
E	4	9.19	34.0	6.54	0.0220	138.89	3994	3519	1672	471	11.3	1685	1446	138826	656	62936	221							0	0	0	0														
Fu	6	0.87	24.5	1.69	0.0045	25.70	309	265	111	28	12.4	117	101	9696	48	4642	18	595	513	819SB	651L	248	77	140	121	58	17	122	105	126SB	97L	50	15	7.42	6.78	4.55	2.67				
Fr	6	0.6	26.5	0.62	0.1424	0.21	235	202	84	21	12.7	90	77	7439	38	3618	14	304	272	248L	158M	157	65	68	60	35	14	59	52	68L	105SB	30	12	7.95	7.26	4.87	2.87	#41 Anderson Res.			
F	6	1.47	27.0	2.31	0.0139	25.86	560	483	209	54	12.2	218	188	18042	89	8545	32	876	761	710SB	756L	379	124	237	205	100	32	206	178	192SB	173L	87	28	8.08	7.39	4.95	2.91	MAP=19.2			
Gu	6	0.4	27.0	1.82	0.0028	28.78	163	140	58	15	12.9	62	54	5145	26	2537	10	365	317	363L	882SB	158	51	76	66	32	10	66	57	77SB	57L	28	9	8.08	7.39	4.96	2.92	4.86	4.53	3.3	2.2
Gr	6	1.84	27.0	4.14	0.0059	80.85	692	598	260	68	12.0	271	233	22402	110	10536	39	1151	992	968L	870M	475	146	327	281	131	39	284	244	240SB	220L	114	34	8.08	7.39	4.96	2.92				
G	6	2.24	27.0	4.14	0.0059	80.85	833	722	316	82	11.9	327	282	27079	132	12658	46	1315	1134	642SB	672L	543	166	389	334	156	46	338	290	286SB	263L	136	40	8.08	7.39	4.96	2.92				
Hu	0	0		0.00																				0	0	0	0														
Hr	0	10.18	28.0	5.69	0.0318	70.84	3620	3177	1473	395	11.1	1477	1267	121679	566	54383	180	3837	3308	2463L	2743M	1586	487	1553	1333	627	186	1350	1159	1132M	1059L	545	162	8.35	7.63	5.12	3.01	#15 Castro Valley			
USGS	15410						2300	2000	952	245																												MAP=24.54			
H	5	10.18	28.0	5.69	0.0138	107.53	3620	3177	1473	395	11.1	1477	1267	121679	566	54383	180							0	0	0	0											6.15	5.76	4.74	2.59
Iu	6	0.69	26.5	1.66	0.0059	12.32	268	230	97	25	12.6	102	89	8512	43	4122	16	482	421	706SB	502L	214	72	112	97	48	16	97	84	112SB	88L	42	14	7.95	7.26	4.87	2.87				
Ir	6	2.89	28.0	1.73	0.0493	1.56	1100	956	425	112	11.8	437	377	36145	175	16798	61	1078	956	1099SB	718L	527	203	336	296	161	61	292	257	335	322	140	53	8.35	7.63	5.12	3.01				
I	6	3.58	27.5	3.39	0.0143	32.32	1323	1151	514	135	11.7	526	455	43491	209	20057	71	1651	1435	1008SB	1153M	714	233	537	465	227	72	467	404	410SB	400L	197	63	8.22	7.51	5.04	2.96				
Ju	0	0.48	25.0	0.81	0.0019	8.85	180	153	63	16	12.8	67	58	5598	28	2733	11	361	315	505SB	167M	158	53	76	66	32	10	66	57	111SB	61L	28	9	7.55	6.9	4.63	2.72	#44 Loma Preita			
Jr	0	0.55	25.5	0.73	0.0510	0.87	208	178	74	19	12.7	79	68	6535	33	3180	13	320	284	281L	152M	155	58	69	61	33	12	60	53	93SB	62L	29	10	7.68	7.02	4.71	2.77		MAP=46		
J	7	1.03	25.0	1.54	0.0197	5.60	370	318	134	34	12.3	141	122	11687	58	5572	21	574	502	399SB	522L	258	88	140	123	62	21	122	107	131SB	110L	54	18	7.55	6.9	4.63	2.72	9.84	9.3	7.16	4.97
Ku	0	0.18	24.5	0.44	0.0250	0.67	70	59	23	6	13.4	25	22	2123	11	1067	5	142	126	129L	43M	69	26	24	22	12	5	21	19	52SB	22L	10	4	7.42	6.78	4.55	2.68				
Kr	0	1.21	25.5	1.68	0.1480	3.45	439	378	161	41	12.3	169	146	13975	69	6637	25	616	541	323L	372M	283	101	156	137	70	24	136	119	119SB	121L	61	21	7.68	7.02	4.71	2.77				
K	7	1.39	25.0	2.12	0.1100	7.93	491	423	180	46	12.2	188	163	15602	77	7370	27	729	636	365L	450M	322	108	190	164	82	26	165	143	129SB	135L	71	23	7.55	6.9	4.63	2.72				
Lu	0	0.8	23.5	0.81	0.0061	5.08	274	234	97	24	12.5	103	89	8511	42	4075	15	469	408	317SB	725L	206	69	107	93	46	15	93	81	141SB	84L	40	13	7.15	6.53	4.39	2.58	#86 San Jose			
Lr	0	0.23	23.5	0.57	0.0840	0.47	84	71	28	7	13.2	31	27	2559	13	1274	5	160	142	99L	51M	77	29	29	25	14	5	25	22	42SB	24L	12	4	7.15	6.53	4.39	2.58	MAP=13.73			
L	8	1.03	23.5	1.38	0.0214	4.81	348	298	125	31	12.3	131	113	10859	54	5159	19	554	483	336SB	507L	244	82	133	116	58	18	116	101	123SB	101L	50	16	7.15	6.53	4.39	2.58	4.91	4.42	2.76	1.52
Mu	0	0.08	22.5	0.46	0.0214	0.75	30	25	9	2	13.8	11	9	878	5	450	2	80	70	30SB	52L	37	14	12	10	6	2	10	9	22SB	9L	5	2	6.88	6.29	4.22	2.48				
Mr	0	0.7	24.0	1.62	0.1698	2.48	246	211	87	22	12.5	92	80	7673	38	3693	14	401	352	167L	178M	183	64	90	78	40	14	78	68	67SB	67L	35	12	7.28	6.66	4.45	2.63				
M	8	0.78	23.5	2.09	0.1205	6.56	267	229	95	24	12.5	100	87	8306	41	3980	15	473	411	183L	207M	206	68	108	93	46	15	94	81	70SB	73L	40	13	7.15	6.53	4.39	2.58				
Nu	0	0.28	22.5	0.81	0.0313	1.19	97	82	33	8	13.1	35	31	2938	15	1450	6	196	172	106SB	137L	90	32	36	31	16	6	31	27	43SB	29L	14	5	6.88	6.29	4.22	2.48	Uvas U/S Uvas			
Nr	0	0		0.00																				0	0	0	0												153900		
N	9	0.28	22.5	0.81	0.0313	1.19	97	82	33	8	13.1	35	31	2938	15	1450	6							0	0	0	0											8260	7810	5530	2690
Ou	0	0.22	22.5	0.71	0.0357	1.50	77	65	26	6	13.2	28	24	2329	12	1158	5	170	149	76SB	108L	77	27	30	25	13	5	26	22	36SB	23L	11	4	6.88	6.29	4.22	2.48	03 REG	9388	4711	
Or	0	0.35	23.5	1.32	0.1480	1.44	125	106	43	11	12.9	46	40	3836	20	1884	8	236	207	94SB	90L	109	39	46	40	21	7	40	35	38SB	35L	18	6	7.15	6.53	4.39	2.58				
O	9	0.57	23.0	2.03	0.1235	4.85	194	166	68	17	12.6	72	62	5984	30	2892	11	367	320	155SB	130L	161	53	78	68	33	10	68	59	51SB	53L	29	9	7.02	6.41	4.31	2.53	Uvas Nr. Morgan Hill			
Pu	9	0.5	22.0	1.52	0.0008	38.69	164	140	57	14	12.7	60	52	5003	25	2421	9	417	356	592L	1419SB	163	47	85	72	32	9	74	63	81SB	54L	28	8	6.75	6.17	4.14	2.43		54000		
Pr	0	0		0.00																				0	0	0	0											16700	14500	7320	2560
P	10	0.5	22.0	1.52	0.0189	11.72	164	140	57	14	12.7	60	52	5003	25	2421	9							0	0	0	0											03 REG	12862	6510	
Qu	0	0.19	22.5	1.01	0.0225	2.68	67	57	22	5	13.3	24	21	2022	11	1010	4	163	142	152SB	91L	72	25	28	24	12	3	24	21	28SB	20L	10	3	6.88	6.29	4.22	2.48				
Qr	0	0.7	23.5	1.04	0.1730	1.25	241	206	85	21	12.5	90	78	7483	37	3598	14	373	328	199L	176M	174	63	83	72	38	13	72	63	75SB	65L	33	11	7.15	6.53	4.39	2.58				
Q	10	0.89	23.0	2.05	0.0728	8.74	296	254	105	26	12.4	111	96	9195	46	4383	16	529	458	228SB	244L	225	72	123	106	52	16	107	92	82SB	81L	45	14	7.02	6.41	4.31	2.53	Uvas Nr Gilroy			
USGS	15420	egulate	lower	limite			18700	15700	6600	1620																													154200		
R+S u	0	0.35	22.0	1.06	0.0140	3.56	117	99	40	10	12.9	43	37	3547	18	1736	7	252	219	235SB	193L	110	36	48	41	21	7	42	36	48SB	35L	18	6	6.75	6.17	4.14	2.43	18700	15700	6600	1620
R+S r	0	0.41	23.5	1.00	0.1990	0.92	145	124	50	12	12.9	54	47	4468	23	2184	9	252	222	65SB	109L	119	43	51	44	23	8	44	38	46SB	40L	20	7	7.15	6.53	4.39	2.58	03 REG	24414	12427	
R+S	11	0.76	23.0	2.09	0.0627	8.43	255	218	90	22	12.5	95	82	7897	39	3782	14	473	410	237SB	214L	202	65	107	92	45	14	93	80	72SB	71L	39	12	7.02	6.41	4.31	2.53	Bodfish & USGS			
Tu	12	0.75	21.0	1.40	0.0008	35.64	230	196	80	19	12.5	84	73	6998	35	3336	12	462	394	717L	216M	178	50	97	83	37	10	64	72	92SB	60L	32	9	6.48	5.93	3.98	2.34		14510		
Tr	0	0		0.00																				0	0	0	0											2800	2000	952	245
T	12	0.75	21.0	1.40	0.0008	35.64	230	196	80	19	12.5	84	73	6998	35	3336	12							0	0	0	0											03 REG	3183	1476	
Uu	13	0.47	21.8	1.02	0.0067	5.48	153	131	53	13	12.7	56	49	4663	24	2260	9	321	278	337SB	339L	137	44	64	55	26	8	56	48	69SB	46L	23	7	6.7	6.12	4.11	2.41				
Ur	0	0		0.00																				0	0	0	0														
U	13	0.47	21.0	1.02	0.0067	5.48	148	126	50	12	12.7	54	46	4460	22	2157	8							0	0	0	0											Littke Arthur			
Vu	0	0.9	22.5	2.00	0.0038	36.01	293	251	104	25	12.4	109	94	9055	45	4309	16	632	541	637L	341M	251	73	148	127	58	16	129	110	116SB	92L	50	14	6.88	6.29	4.22	2.48	SC#65			
Vr	0	1.3	23.5	2.39	0.0472	17.27	433	372	157	39	12.2	164	142	13592	67	6410	23	759	656	415L	451M	317	99	193	167	79	24	168	145	124SB	124L	69	21	7.15	6.53	4.39	2.58	3090	2810	1630	562
V	14	2.2	23.0	2.54	0.0115	23.45	697	602	257	64	11.9	266	229	22001	106	10196	36	1114	959	664SB	621M	456	138	314	269	125	37	273	234	227SB	205L	109	32	7.02	6.41	4.31	2.53	03 REG	3523	1674	
Wu	15	1.11	22.0	1.55	0.0039	18.61	349	299	124	30	12.3	130	112	10792	53	5096	19	658	566	813SB	420M	267	80	159	136	62	18	138	118	140SB	105L	54	16	6.75	6.17	4.14	2.43				
Wr	0	2.07	22.0	2.43	0.0026	76.73	630	542	230	57	11.9	238	205	19680	95	9115	32	1183	1006	781SB	522L	449	123	324	274	118	31	282	238	234SB	187L	103	27	6.75	6.17	4.14	2.43				
W	15	3.18	21.0	3.98	0.0030	157.68	902	778	333	82	11.7	341	293	28170	134	12840	43	1718	1447	745SB	708L	617	157	507	424	176	43	441	369	296SB	256L	153	37	6.48	5.93	3.98	2.34				
0	0	0		0.00																				0	0	0	0														
Xr	0	3.14	23.5	3.69	0.0328	30.77	998	864	375	95	11.7	385	331	31803	152	14595	50	1436	1235	1142M	642L	585	176	434	371	173	51	377	323	337M	271L	150	44	7.15	6.53	4.38	2.58				
X	15	3.14	23.5	3.69	0.0328	30.77	998	864	375	95	11.7	385	331	31803	152	14595	50							0	0	0	0														
0	0	0		0.00																				0	0	0	0														
Yr	0	6.76	24.0	8.40	0.0181	287.88	2105	1834	820	210	11.3	828	711	68289	319	30640	100	3148	2664	1794M	1389L	1164	309	1125	948	405	104	978	824	666M	577L	352	90	7.28	6.65	4.47	2.63				
Y	15	6.76	24.0	0.00			2105	1834	820	210	11.3	828	711	68289	319	30640	100							0	0	0	0														

Uvas Creek
S-D Curves (Max.)
A. D. Saah

Generalized Utinized Storage-Discharge Relationships

15% RTIMP
NO ROUT 0 .003

SV	0	5	8	12.5	20	30	180
SQ	0	100	155	200	230	285	800



Uvas Creek
Storm Drain Routing

NOTE: NO ROUT FOR SLOPES>.003

Basin	Tributar	Urban (sq. mi)	Urban Ac	Card Levee Ind.									SLOPE	ROUT/NO	
Au	1	0	0	2											
				2											
Bu	2	0	0	2											
				2											
Cu	3	0	0	2											
				2											
Du	4	0	0	2											
				2											
Eu	4	0	0	2											
				2											
Fu	6	0.87	557	2	SV	0.0	3.4	5.0	8.4	13.4	20.1	120.6	0.005	ROUT	
				2	SQ	0.0	67.0	103.9	134.0	154.1	191.0	536.0			
Gu	6	0.4	256	2	SV										
				2	SQ										
Hu	5	0	0	2	SV										
				2	SQ										
Iu	6	0.69	442	2	SV	0	3	5	9	14	21	124	0.006	NO	
				2	SQ	0	69	107	138	159	197	552			
Ju	7	0.48	307	2	SV	0	2	4	6	10	14	86	0.002	ROUT	
				2	SQ	0	48	74	96	110	137	384			
Ku	7	0.18	115	2	SV										RTIMP
				2	SQ										
Lu	8	0.8	512	2	SV	0	4	6	10	16	24	144	0.006	ROUT	
				2	SQ	0	80	124	160	184	228	640			
Mu	8	0.08	51	2	SV	0	0	1	1	2	2	14	0.024	NO	RTIMP
				2	SQ	0	8	12	16	18	23	64			
Nu	9	0.28	179	2	SV	0	1	2	4	6	8	50	0.031	NO	
				2	SQ	0	28	43	56	64	80	224			
Ou	9	0.22	141	2	SV	0	1	2	3	4	7	40	0.036	NO	
				2	SQ	0	22	34	44	51	63	176			
Pu	10	0.5	320	2	SV	0	3	4	6	10	15	90	0.001	ROUT	
				2	SQ	0	50	78	100	115	143	400			
Qu	10	0.19	122	2	SV	0	1	1	2	4	6	34	0.023	NO	
				2	SQ	0	19	29	38	44	54	152			
R÷S u	0	0.35	224	2	SV	0	2	3	4	7	11	63	0.014	NO	
				2	SQ	0	35	54	70	81	100	280			
Tu	12	0.75	480	2	SV	0	4	6	9	15	23	135	0.001	ROUT	
				2	SQ	0	75	116	150	173	214	600			
Uu	13	0.47	301	2	SV	0	2	4	6	9	14	85	0.007	NO	
				2	SQ	0	47	73	94	108	134	376			
Vu	14	0.9	576	2	SV	0	5	7	11	18	27	162	0.004	NO	
				2	SQ	0	90	140	180	207	257	720			
Wu	15	1.11	710	2	SV	0	6	8	14	22	33	200		NO	
				2	SQ	0	111	172	222	255	316	888	0.004		
Xu	15	0	0	2	SV										
				2	SQ										
Yu	15	0	0	2	SV										
					SQ										

10.2 APPENDIX 2 - HEC 1 SUMMARY INPUT AND OUTPUT (COMPUTER DISC)